MARCH 14, 1960

# PAPER TRADE JOURNAL

**NEW PAPER MACHINES . . .**
are in at O-I's Big Island mill and at Howard Smith Paper Mills

**TUBE SCALING, CORROSION . . .**
account for most costs in black liquor evaporators maintenance

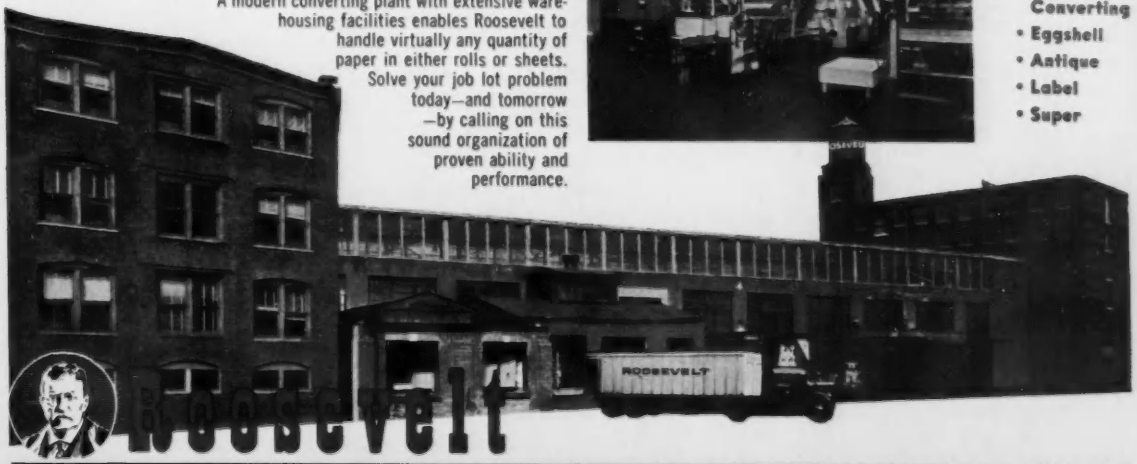
**AIR KEEPS THE ICE OUT . . .**
of pulpwood storage basins at Finland's large Kaukopää Mills


1

PROGRESSIVE ORGANIZATION
FOR MARKETING
ALL JOB LOTS!

- Offset
- Bond
- Enamel
- Machine Coated
- Writing
- English Finish
- Mimeo
- Index
- Bristol
- Tag
- Sulphite Converting
- Bleached Sulphate
- Envelope
- Kraft Converting
- Eggshell
- Antique
- Label
- Super

To paper mills looking for a dependable and continuous outlet for sub-standard and side-run tonnage, Roosevelt offers a strong sales organization geared to move all grades of paper to well-developed domestic and export markets. A modern converting plant with extensive warehousing facilities enables Roosevelt to handle virtually any quantity of paper in either rolls or sheets. Solve your job lot problem today—and tomorrow—by calling on this sound organization of proven ability and performance.

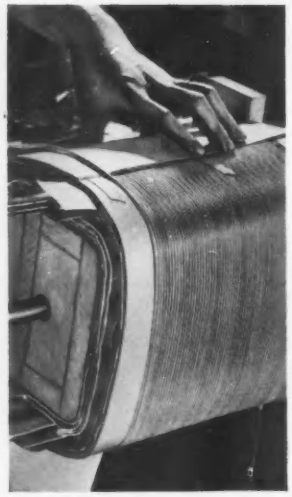



Roosevelt
PAPER COMPANY
ARAMINGO AND CUMBERLAND • PHILADELPHIA 25, PA.


Editorial Dept.
University Microfilms, Inc.
313 N. First St.
Ann Arbor, Mich.

*—as used to make better dielectric sheet at Johns-Manville, New York, N. Y.*

## How to transform a problem-product into a profit-maker—with CHEMIGUM LATEX



***The problem was*** the standard-saturated asbestos dielectric sheet for transformers. It insulated well, but the solvents of one manufacturer's varnish system were not compatible with the saturant in the paper.

***The answer was*** to replace the standard resins with CHEMIGUM LATEX. Incorporated by single-step beater addition rather than multipass saturation, CHEMIGUM LATEX not only fully resisted the solvent attack, but also lowered costs. Moreover, it did so with no sacrifice in strength, moisture-resistance, heat-resistance or handling characteristics.

***How can CHEMIGUM LATEX help you*** turn problems into profits? For full details, including the latest *Tech Book Bulletins,* write Goodyear, Chemical Division, Dept. O-9427, Akron 16, Ohio.

**GOODYEAR**

**CHEMICAL DIVISION**

Chemigum—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

# WHY *Microlyzed** JORDAN FILLINGS ARE NOTED FOR ENDURANCE

Microstructural study of raw steel BEFORE heat treating. Photomicrographs are 400 x magnifications using Picric acid etching reagent.

Microstructural studies of cutting edge area and ears AFTER heat treating illustrating uniformity of hardness throughout.

***Regardless of the stock, consistency or pressure, MICROLYZED Fillings by BOLTON lead in providing what papermakers want most in Jordan Fillings . . .***

**LONG WEAR** *because they are custom-processed from specified Jordan steel to a precise balance of hardness and toughness.*

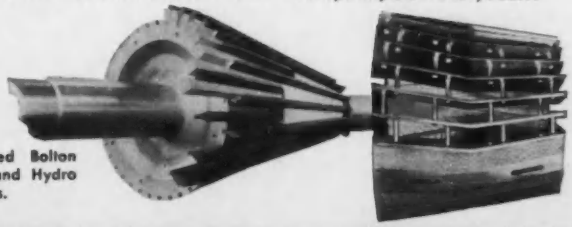
**EVEN WEAR OF PLUG AND SHELL KNIVES** *because of guaranteed uniformity of hardness in each set of fillings and throughout each knife in the set.*

In the manufacture of Jordan Fillings, Bolton controls the entire process. Starting in the laboratory, a photomicrostructural analysis is made of each shipment of Jordan steel. Destructive mechanical properties tests are made, which must fall within the rigid tolerance standards established. During production, nondestructive tests assure the desired properties previously determined are achieved during heat treatment.

Furnace temperatures are controlled to within tolerances of 5 degrees. Hardening is done in a BOLTON-designed quench in which each knife is clamped to maintain straightness. This exclusive method eliminates the need for later straightening. Papermakers receive the benefits of a stress-free product.

Knowing that performance is a reflection of the materials used and the degree of skill and care shown in fabrication, no compromise is permitted at BOLTON.

Fifty two years of specialized Jordan Fillings experience is built in to every knife. So is the craftsmen's attitude — an attitude of conviction that none will deliver longer, more economical, day in day out resistance to wear than BOLTON MICROLYZED FILLINGS . . . RING TYPE — WEDGELESS — HYDRO-TRUSS. *All are made by John W. Bolton & Sons, Inc., Lawrence, Mass.*



Partially assembled Bolton Wedgeless Plug and Hydro Truss Shell Fillings.

**The Papermaker suggests:**

Write today for Bulletin No. F-556 on Bolton Microlyzed Fillings. It has full information on:

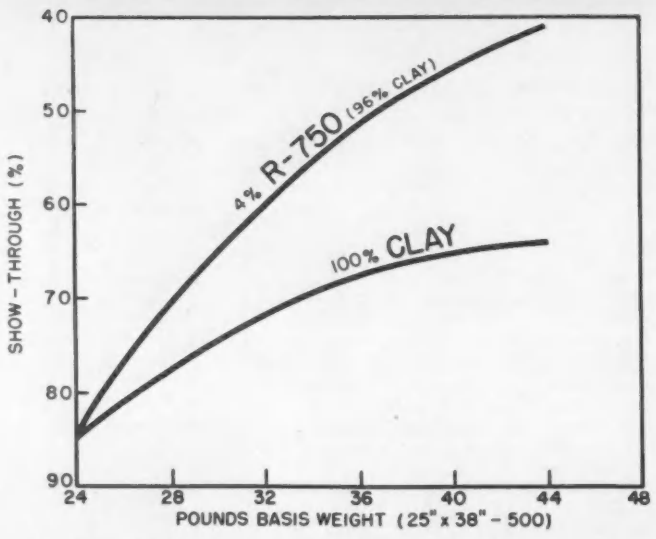
- *Wedgeless Plug Fillings*
- *Hydro-Truss Shell Fillings*
- *Ring Type Fillings*
- *Special Heat-Treated Steel*
- *Bolton Stainless Steel*
- *Bolton Phosphor Bronze and other alloys*
- *Fillings Separator Materials*
- *Knife Sizes*
- *Stainless Steel Plug Jackets*
- *Technical Advisory Service*
- *Instruction Charts on Changing Fillings*

**BOLTON EMERSON**

TRADE MARK

*Filling the Needs of Papermakers:* JORDANS • CLAFLINS • FILLINGS • PLUGS • STAINLESS PLUG JACKETS • BEATER BARS AND BED PLATES • SHOWER PIPES • SUCTION BOX COVERS • MAGNETIC EQUIPMENT • MACHINE KNIVES.

# HIGH OPACITY HORSE HEAD® R-750 (RUTILE) TITANIUM DIOXIDE




A lighter-weight sheet with greater resistance to show-through can be obtained by replacing only 4% clay with HORSE HEAD R-750 in the coating. The above results were obtained on a 24-lb. base stock coated one side only.

You need only moderate percentages of HORSE HEAD R-750 in your coating to obtain improved show-through resistance at lower basis weight. This means lower mailing costs for your customers.

*Here's why:*

**HORSE HEAD R-750**, having a rutile crystal structure, has a high refractive index . . . far higher than clay, even higher than anatase titanium dioxide.

**HORSE HEAD R-750** is economical, too. In coated papers it provides more show-through resistance per dollar than anatase titanium dioxide.

**HORSE HEAD R-750** is especially suited for use in coated papers of all types. It provides excellent color and brightness, good dispersion, low water demand, good flow properties in coating colors.

**THE NEW JERSEY ZINC COMPANY**

# PAPER TRADE JOURNAL

PUBLISHED WEEKLY SINCE 1872

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**Week of MARCH 14, 1960—*Vol. 144, No. 11***



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**REMEMBER THESE DATES**

**May 23-25. TAPPI Coating Conference, Edgewater Beach Hotel, Chicago, Ill.**

**June 14-16. TAPPI Bleaching Conference, Edgewater Beach Hotel, Chicago, Ill.**

**June 7-9. PIMA National Meeting, St. Francis Hotel, San Francisco, Calif.**


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MODEL 105-A

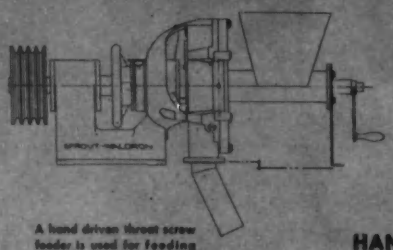
# NEW "SPROUT" LABORATORY REFINER

Here is a precision-built machine design which simulates commercial refiner operations, saving valuable manhours and eliminating costly installation errors.

This 12″ single rotating disc laboratory refiner has the same mechanical features and plate designs used in the famous 36-2 "Sprout". Construction is rugged, dust-tight, water-tight and planned to permit easy access for plate changing. Simplified tramming makes it possible to maintain perfect parallelism of the disc, thus insuring uniform refining of the feedstock and even plate wear.

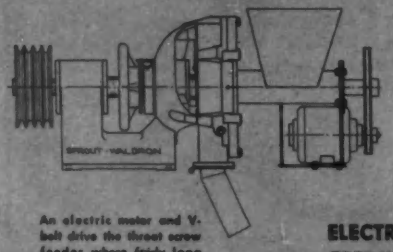
This "Sprout" lab refiner is available in cast iron or acid-resistant construction. It is suitable for continuous operation at horsepowers between 25 and 40. For intermittent operation, maximum horsepower may be increased to 65.

Specifications and details are covered in Bulletin 17-B. Copies available on request.



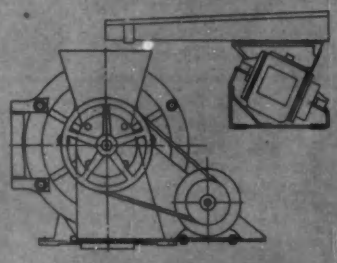
A hand driven throat screw feeder is used for feeding most materials in laboratory work.

**HAND FEEDING**



An electric motor and V-belt drive the throat screw feeder where fairly long runs are necessary.

**ELECTRIC FEEDING**



A magnetic vibratory feeder supplies a constant accurate flow of material.

**MAGNETIC FEEDING**

**Feeding Arrangements MODEL 105-A**

**SPROUT, WALDRON & CO., INC.**
**PULP AND PAPER MILL DIVISION**
MUNCY, PENNSYLVANIA, U. S. A.
REFINERS • CONVEYORS • FEEDERS • FIBER PRESSES
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E/206

# SCAPA

GROUP "C"

## SYNTHO-ASBESTOS Dryer Felts

incorporate our exclusive

## * "3-DECKER" STRUCTURE

- Dacron-Nylon Working Face
- Syn-Reinforced Asbestos Center
- Syn-Reinforced Cotton Back

*(Approx. 25% Synthetic Content)*

They insure excellent drying, combined with unusually high resistance to thermal, chemical and mechanical degradation.

**Types 3175-C (SRA) and 3480-C (SRA) supplied in all widths either open-ended or with Clipper Seam.**

**Type 3980-C (SRA) supplied endless with hand-spliced seam.**

*World Patents Granted and Pending

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**John B. Chandler Co.**
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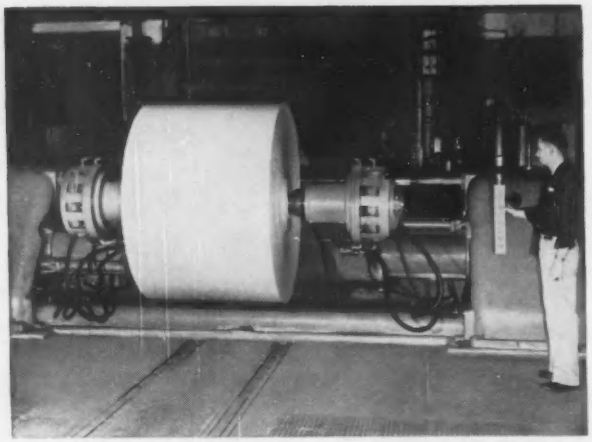
415 JACKSON ST., OREGON CITY, ORE.

**Ready for the roll.** Notice the absence of a shaft. Roll is moved in between lifting arms which close under pressure and elevate to desired height.

# LANGSTON SHAFTLESS UNWIND STAND

## Boost your production . . . reduce your slitting and rewinding costs



**Easy, fast, completely safe.** One man does everything. Operating push-button controls, he closes lifting arms, elevates roll, sets brakes.

One man can load the heaviest roll. No heavy shaft to handle. No cone tightening. No couplings to engage. No crane lifting. Just pushbuttons. This is the Langston heavy duty shaftless unwind stand for rewinding and converting applications.

You not only save time, you also get better unwinding. Roll can be positioned laterally by push-button control—even when the machine is running. It's held firmly under pressure for complete safety throughout the unwind. Several braking arrangements can be provided to handle a wide range of grades and conditions. Available extras provide for handling very narrow rolls; for constant tensioning; for automatic braking of idler rolls; for automatic web alignment and side register control; for web oscillation; and for local or remote control.

This new Langston shaftless unwind stand can be used with any make of slitter. Available for maximum roll widths from 40 to 132 in. and diameters from 14 to 84 in. Speeds to 3000 fpm and higher. For complete information, write Samuel M. Langston Co., Camden 4, N. J.

**LANGSTON** *Leadership...by design*

# designed for greater size...ability

For surface sizing paper or board, water soluble GELVATOL resins offer dramatic increases in strength, transparency, grease resistance and printing qualities. Can be applied by any of the conventional methods: tub, size press, and calender stack.

Why not make a test run and notice the—

**Increased Strength.** GELVATOL sizing significantly increases the Mullen and fold endurance of rag stock and other high quality paper.

**Increased Transparency.** GELVATOL sizing improves the gloss, grease-resistance and transparency of glassine.

**Increased Grease-Resistance.** Surface sizing with GELVATOL makes paper grease-resistant; surface coating makes paper grease-proof. Improves wax holdout.

**Increased Printability.** GELVATOL imparts a smooth finish to paper. Improves ink holdout and contrast. Provides excellent varnish holdout.

GELVATOL is available in a wide variety of grades. Whatever your sizing needs it will pay you to write for full technical information to Shawinigan Resins Corporation, Department 6311, Springfield 1, Massachusetts.

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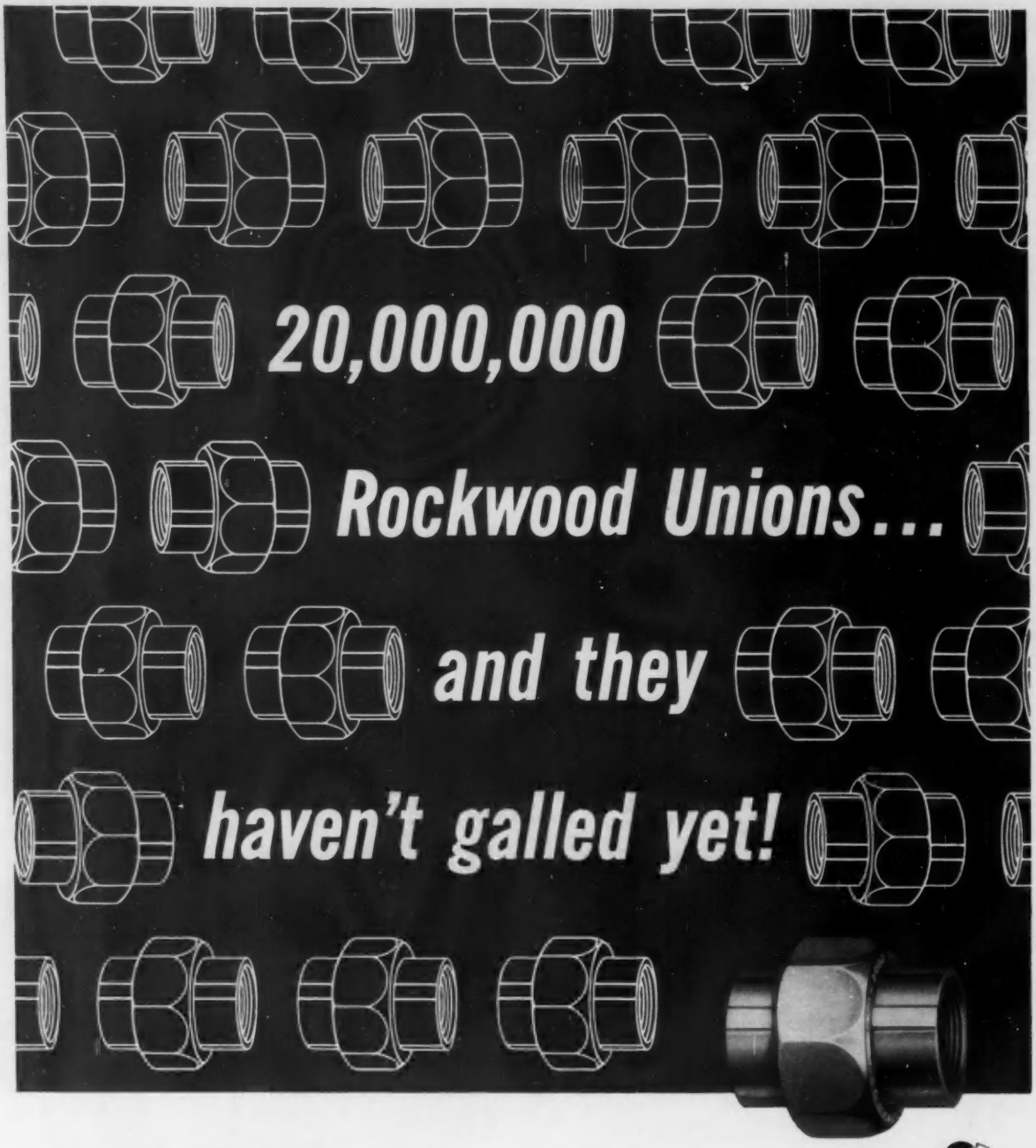
**GELVATOL®** ***polyvinyl alcohol by***

**SHAWINIGAN RESINS®**




*Only* ROCKWOOD Cold Forged Steel Unions have the hardness differential which *assures* fast, easy make-up, a tight seal, and free from galling. Male seat is heat-treated to a hardness substantially higher than that of the female seat. Then both seats are forged in place and double-locked under 100,000 and 400,000-pound pressures. Other outstanding features include: special color-coding for immediate identification, Rockwoodizing which gives all surfaces *positive* protection against corrosion, interchangeable parts. Get complete information now. Write for facts.

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UNITANE 0-110 is unsurpassed in achieving high opacity, whiteness and brightness. It enables you to meet publishers' demands for thinner, lighter papers with finer printing qualities. Ask your Cyanamid Pigments representative about UNITANE 0-110.

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*Idea suggested by G. H. Stevenson, Empire, Oregon

Photo of Grand Coulee Dam, Washington State by Ewing Galloway, N. Y.

# "Reminds me of HAMILTON Felts... they're engineered for long service and fast water removal"

"The pumps at Grand Coulee Dam
can deliver—for irrigation purposes—
528,400,000 gallons of water per hour.
Hamilton Felts, too, are
engineered for fast water removal.
And each Hamilton Felt,
also like Grand Coulee Dam,
has been engineered
for long, trouble-free service.
That's why Hamilton Felts
beat the high cost of downtime
and keep your machines running
at top speed—longer."
If this is what you want your felts to do
why not talk it over with your
Hamilton Felt service salesman—soon?

YOU CAN'T BEAT
**Hamilton**
**FELTS**

## * WIN... *A NEW Spincast Fishing Outfit*

"What famous landmark reminds you of Hamilton Felts? Tell us why in a few words; sign your name and address and name of company. The best letter each month by a papermaker wins a new 1960 model Shakespeare Spincast Rod and Reel — FREE! Every papermaker entrant receives a famous Rex Spoon fishing lure — FREE. Send me your suggestion — today. Ham Feltz, 612 First National Bank Bldg., Cincinnati 2, Ohio."

**SHULER & BENNINGHOFEN, HAMILTON, OHIO**

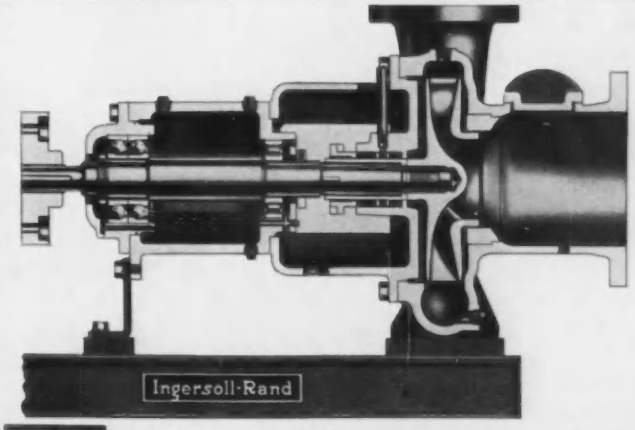
# entirely different

## This is the only centrifugal pump that can handle 10% stock concentrations

*Yes, the patented, diverging impeller* in Ingersoll-Rand's Class EL, EM, and EH stock pumps will handle stock at consistencies as high as 10%. The simple diverging impeller design, with few blades and properly proportioned casing, gives these pumps their almost unbelievable operating characteristics.

Any stock—treated, sized or foamy—containing air or gas can be pumped without losing prime or vapor binding. That's because the entrained air or gas enters the vacuum space between the blades and passes through the pump, leaving it unbound and unclogged. These pumps can also be furnished with a conventional impeller for handling lower consistency stock and various industrial liquids.

Ingersoll-Rand Class EL, EM, and EH stock pumps are available in capacities to 7000 gpm and heads to 225 ft. Contact your nearest I-R representative for complete information or write for Bulletin 7296.

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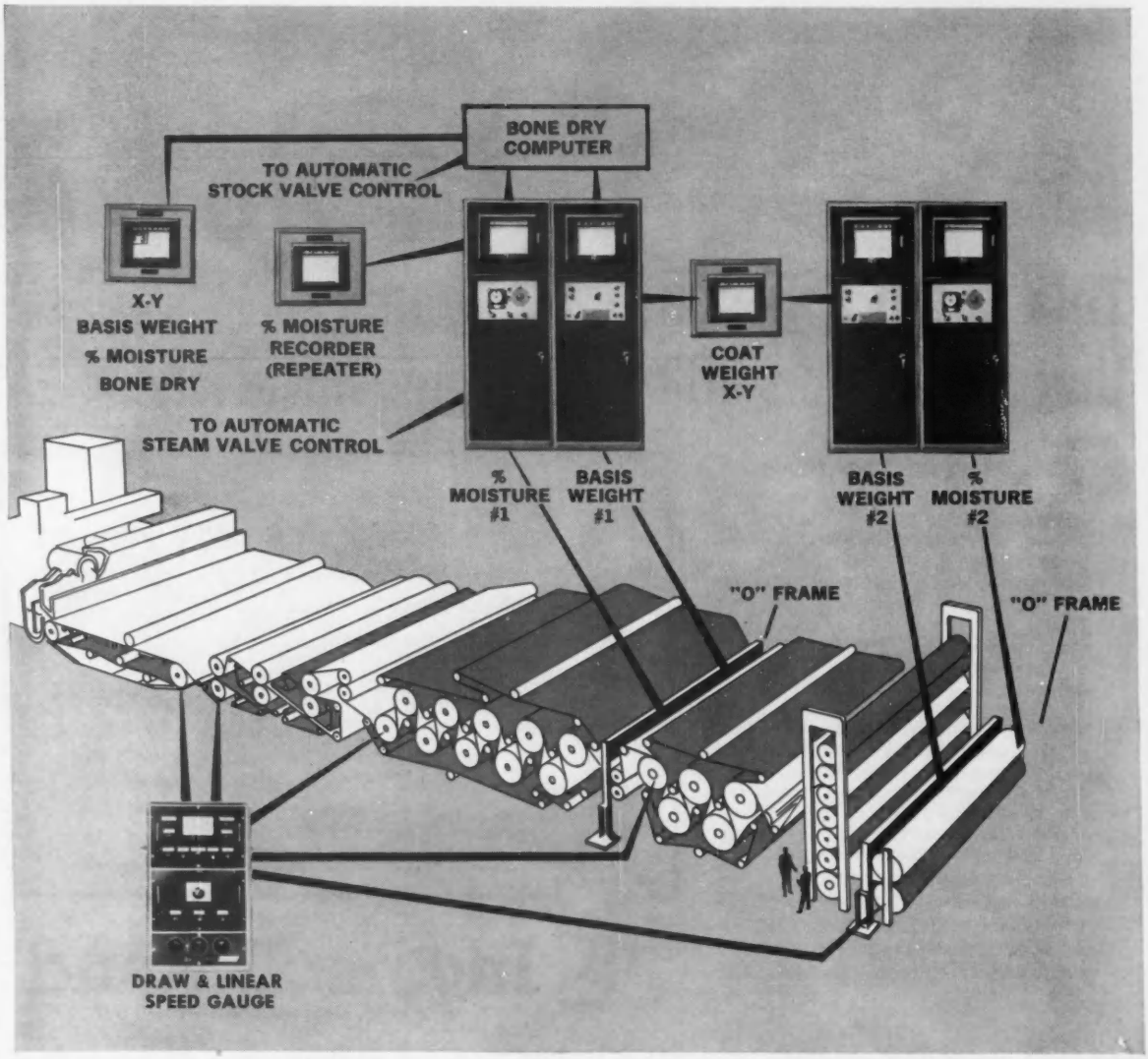
**CURTISS-WRIGHT**
CORPORATION • PRINCETON, N. J.

Proven Curtiss-Wright "on machine" measurement and control systems expand papermaking profits by increasing your saleable output and reducing costly web breaks.

Curtiss-Wright Beta Gauge—Aquatel equipment combines basis weight and moisture measurement units for both stock valve and dryer steam valve control in one integrated system. Only the Curtiss-Wright system provides a bone dry sheet profile and automatic control from the bone dry weight.

In addition, Curtiss-Wright draw and linear speed equipment provides instantaneous precision measurement of draw speed permitting rapid adjustment before damaging conditions can develop.

Prove to yourself how these controls can increase your operating profits. Ask to see a Curtiss-Wright engineer.



# DESIGNED . . . TO GIVE MORE MILEAGE!

# RICHLAND 343

## Synthetic Reinforced Dryer Felt

RICHLAND 343 combines maximum drying efficiency with the stamina and staying-power of a "marathon runner." It's engineered to endure longer runs where more mileage and real wear-resistance are needed. RICHLAND 343 is a sturdy, fully stabilized felt, constructed to withstand the destructive effects of high chemical concentrations and a great degree of mechanical abrasion. At the same time, it provides the matchless drying characteristics available with cotton felts. Reinforced with synthetic fibers in the warp and filling, RICHLAND 343 will maintain its rugged effectiveness day after day . . . week after week, frequently outrunning asbestos felts and staying on the job so much longer than cotton felts, that it reduces the cost per ton of paper made. Sold only pre-stretched and pre-shrunk, available with or without clipper seams.

**MOUNT VERNON DRYER FELT FAMILY** RICHLAND 343 is just one of Mount Vernon's full "family" of scientifically designed dryer felts. There's an individual felt for virtually every paper machine position and every paper-making need.

**Another Mount Vernon Dryer Felt Success Story . . .**

A large producer of newsprint discovered that a tougher, more durable felt was needed for the top position on one of his machines . . . a felt that would withstand high chemical concentrations and speed while still providing efficient drying. Machine speed was 2200 feet per minute with a steam pressure of 40 lbs. Under these conditions, average all-cotton felts lasted approximately 75 days. Mount Vernon engineers recommended RICHLAND 343, a synthetically reinforced dryer felt designed to yield more mileage in hard-working positions. Result . . . 120 days of highly effective running. RICHLAND 343 turned in an outstanding dryer felt performance and remained on the job 60% longer.

*UNIFORMITY Makes The Big Difference In Industrial Fabrics*

Mount Vernon Mills, inc.

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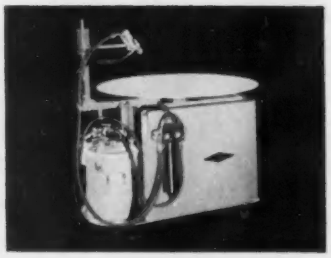
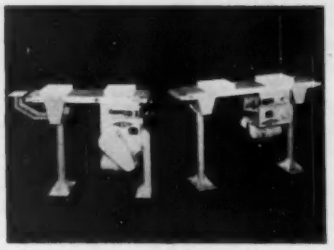
# Let the LAMB 'Pencil Man' help you pre-plan

- Roll Finishing Systems
- Sheet Finishing Systems
- Pulp Finishing Systems
- Individual Unit Installations

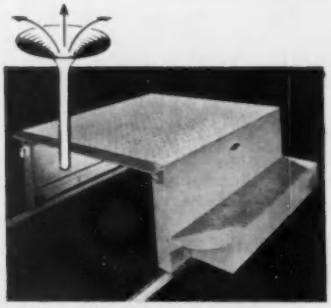
Yes—the "educated pencils" of the LAMB engineering staff can short-cut your way to increased profits, increased production, and lower operating and maintenance costs. Your carefully planned installation can save you money and step up finishing room efficiency to a profitable volume. LAMB engineers have the experience in the paper mill industry that is essential to enable them to design and engineer the *right* layout for your individual mill. And, too—if your requirement is only for a single unit—head gluer, roll header, lowerator, stacker, or AIRFLOAT® Tables—you can depend on LAMB to supply the most efficient equipment and provide the best investment that can be made in equipment of this type.



**NEW** improved design LAMB Head Gluer. Rotating table, adjustable spraying head. Speeds roll wrapping, saves glue, time and manual effort.



**NEW** LAMB special Ream Conveyors can be engineered to suit your finishing room needs.



**NEW** LAMB AIRFLOAT Table features continuous air escape through specially shaped holes in table top. Economy design. Stacks of paper float light as a breeze. Self-powered, traveling Skid Stacker shown.

LAMB

**LAMB-GRAYS HARBOR CO., Inc.**

Hoquiam, Washington, U.S.A. Phone: GEneral 8-1000

## Install a Laminator

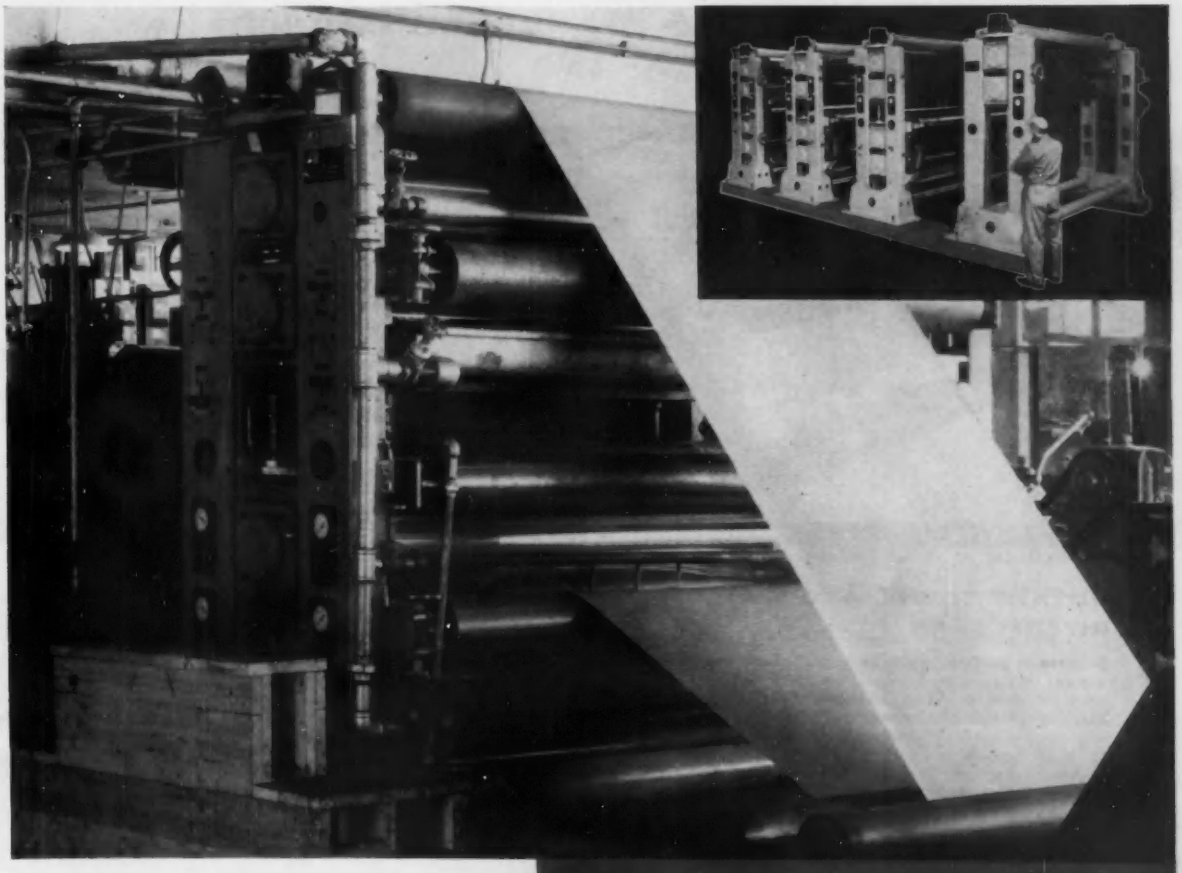
### *To Insure Top Quality Production, Maximum Control, Versatility*

These features of a Black-Clawson laminator assure its user of top quality production . . .

1. Micro-adjustment of roll nips
2. Precision rolls and bearings
3. Choice of application method... Squeeze, Kiss, Reverse Kiss
4. Air-loading and lifting of rolls
5. Indicating and recording controls for repeat performance
6. Minimum parts inventory... interchangeable rolls and bearings

Through application engineering experience and standardization of machine components we can furnish a 2 to 5 ply laminator to meet your most exacting requirements. Write for reprint "Board Laminators."

**The Black-Clawson Company**
**Dilts Division, Fulton, N. Y.**

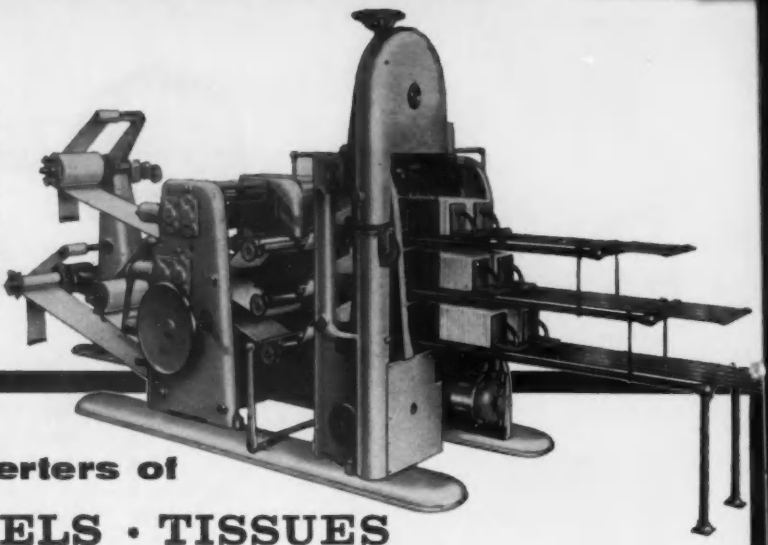


***Convert with Confidence***

**BLACK-CLAWSON**

## A NAPKIN FOLDER WITH TRIPLE EMBOSSER

Pacemaker for the industry, this machine produces regular or facial quality napkins (and other paper or cellulose products) of all standard sizes in perfectly folded squares. Rotary in operation, it handles one to four parent rolls simultaneously and produces up to 2400 completed printed and embossed napkins per minute! Multi-color oil or flexographic ink printing and embossing units can be furnished or added as required. Heavy duty construction, high production speed, dependability, low original cost plus low maintenance expense makes this machine the most popular napkin producer in the industry.



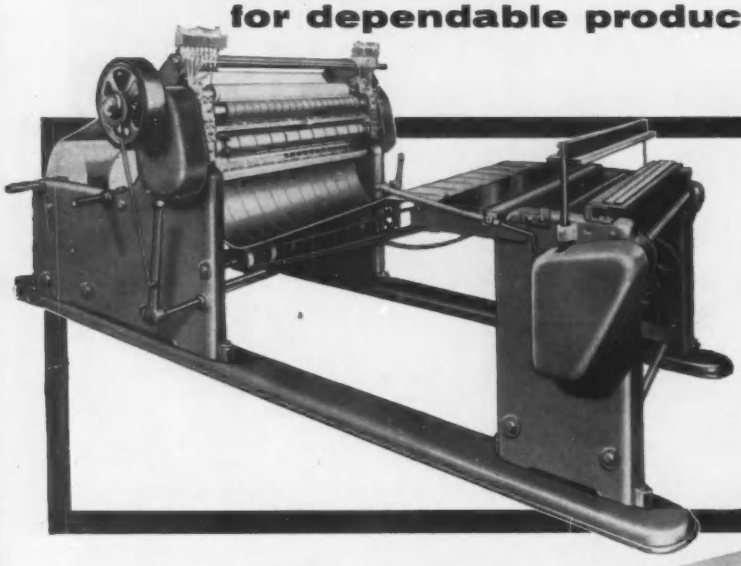
**Leading converters of**

# NAPKINS • TOWELS • TISSUES

**rely on these**

# HUDSON-SHARP "workhorses"

**for dependable production capacity**

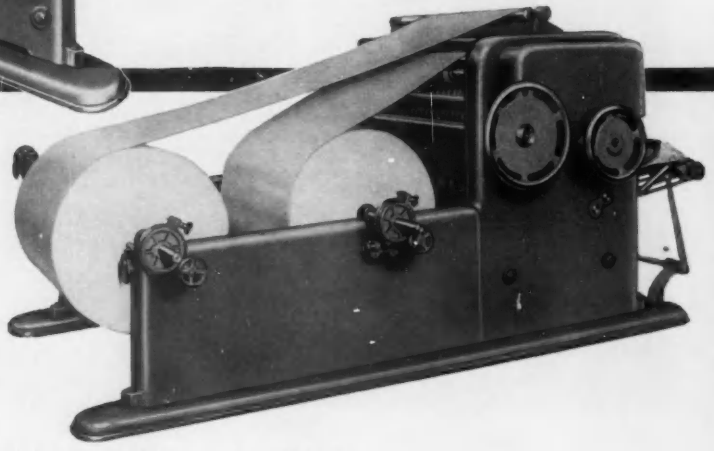


## ROTARY TISSUE INTERFOLDER

Production of single or double-ply interfolded toilet tissues in single or multiple folds reaches unprecedented new highs with this modern Hudson Sharp machine. Sturdily constructed and completely rotary in operation it carries paper from parent rolls through feed rolls, into folding cylinders, and continuously delivers a product of exact sheet count to the packaging unit. Equipped with a semi-automatic banding unit, one operator easily handles the machine's entire output. Embossing units can be added if desired.

## ROTARY TOWEL AND WAX INTERFOLDER

Designed to produce interfolded towels in any standard size, this machine produces from 10 to 12 cases, per towel width, per hour! Completely rotary in operation, all necessary adjustments are simple to make and easily accessible. Furnished in any widths up to 60" in all standard sizes and folds. Besides towels, this machine is practically adaptable for interfolding wax papers, glassines, butcher wraps, delicatessen papers and others. Write for complete information on any of these popular Hudson Sharp machines that are continuously increasing converting production throughout the industry.



*Putting Ideas to Work*

FOOD MACHINERY AND CHEMICAL CORPORATION

**FMC Packaging Machinery Division**

Hudson-Sharp Machine Company

1201 MAIN STREET, GREEN BAY, WISCONSIN

# No. 1 Requirement: *Quality*

## *Here's How a Mill Kept It... And Saved $.95 per Paper Ton!*

**Cash savings on size requirements multiplied by power savings, cleaner machines, better retention**

Fine writing paper production can not take process short-cuts which affect quality . . . so this instance of Nalco Sodium Aluminate performance is more than a cost-cutting story—sheet specifications were considerably improved with Nalco 680 Sodium Aluminate—on top of all the other advantages!

### Facts from Figures

This is the way the chemical costs work out on a "per ton" basis:

| | |
|---|---|
| Size Requirements (without Nalco Sodium Aluminate)... | 30.25 lb. |
| Size Requirements (with Nalco Sodium Aluminate)... | 21.60 lb. |
| Pounds of Size Saved... | 8.65 |
| Alum Requirements (without Nalco Sodium Aluminate)... | 40.00 lb. |
| Alum Requirements (with Nalco Sodium Aluminate)... | 30.00 lb. |
| Pounds of Alum Saved... | 10.00 |
| Savings on Size (at 15.3 cents per lb.)... | $ 1.32 |
| Savings on Alum (at 2.2 cents per lb.)... | .22 |
| | $ 1.54 |
| Less cost of Nalco Sodium Aluminate (at 10.7 cents per lb.)... | .59 |
| ***TOTAL NET SAVING, per ton of paper*** | **$ .95** |

Add to the dollar savings above: more fines and furnish kept in the sheet; more rapid reaction time to cut soluble alumina losses in the white water; higher pH to give means of adjusting size-alumina-pH ratio, and to cut corrosion damage; lower power requirements and cleaner machines.

Nalco Sodium Aluminate is a concentrated package of stable, soluble alumina and alkalinity that produces positive advantages all along the line!

### Paper Quality Improved

Nalco Sodium Aluminate not only produces spectacular figures in processing savings, but also improved sheet specifications in the mill whose alum-aluminate costs are given above: *Size ratings jumped from a range of 45-50 up to 50-60. Ash content went from 5.6-5.8% to 7-7.1%!*

Other quality improvements include: better aging, folding endurance, burst strength, workability and reduced brittleness.

### Action When It Is Needed

Results with Nalco Sodium Aluminate—and every other Nalco chemical used in paper processing—are backed by Nalco Field Service Men whose experience and willingness to help can be of real value to you . . . whether the situation calls for emergency action or long-range planning for better paper products at lowest possible production costs.

For action that leads to results like these in your mill, call your Nalco Field Service Man, or write:

*National Aluminate Corporation is now*

**NALCO CHEMICAL COMPANY**

**6221 West 66th Place • Chicago 38, Illinois**

*Subsidiaries in England, Italy, Mexico, Spain, Venezuela and West Germany*

*In Canada—Alchem Limited, Burlington, Ontario*

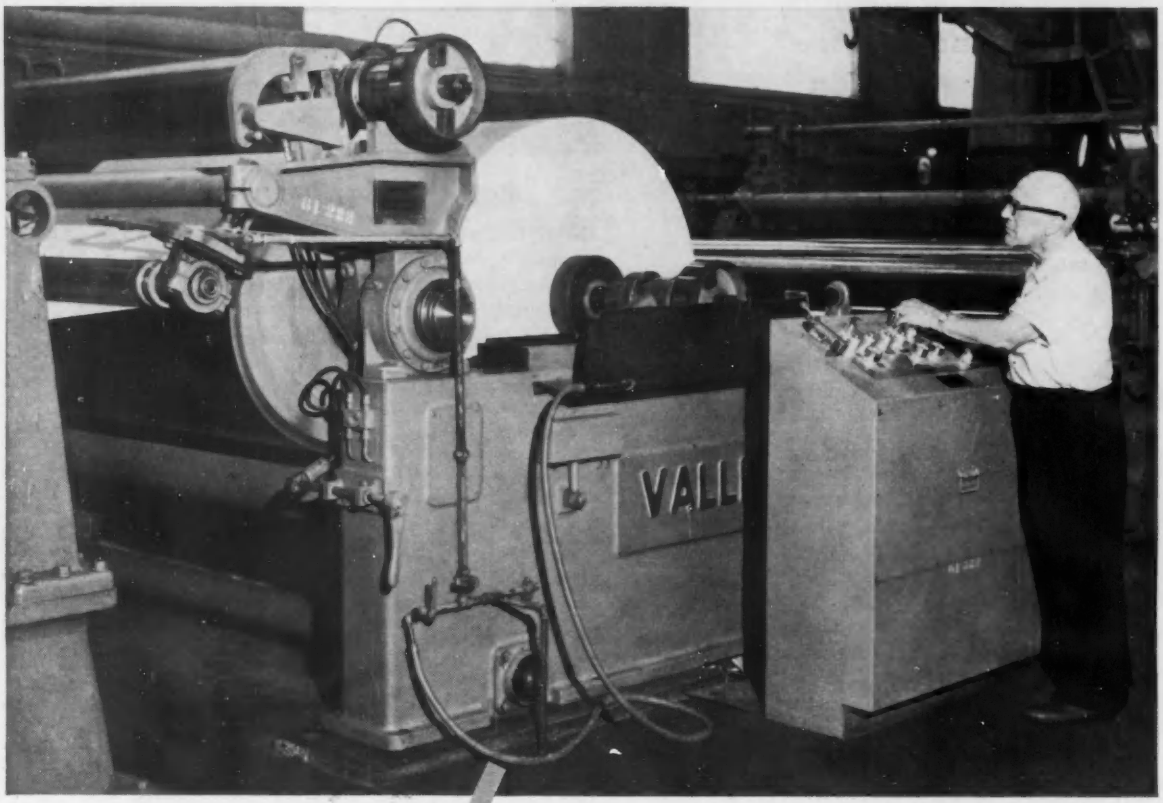
Nalco®

***...Serving Industry Through Practical Applied Science***

Nalco CHEMICALS

# VALLEY HORIZONTAL TRACK REELS*

## at Consolidated Water Power & Paper Company
## Wisconsin River Division



*Superintendent Carl Simon at the controls*

***LEVEL WIND***

***SURFACE WIND***

***CENTER WIND***

Horizontal Track Surface Wind Reel designed for later addition of center wind components.

A major departure in reel design to provide completely versatile operation, surface or center wind, or a combination of both, with zero loading of the spool to the drum. Spool weight supported completely by the ways with no weight component on the drum.

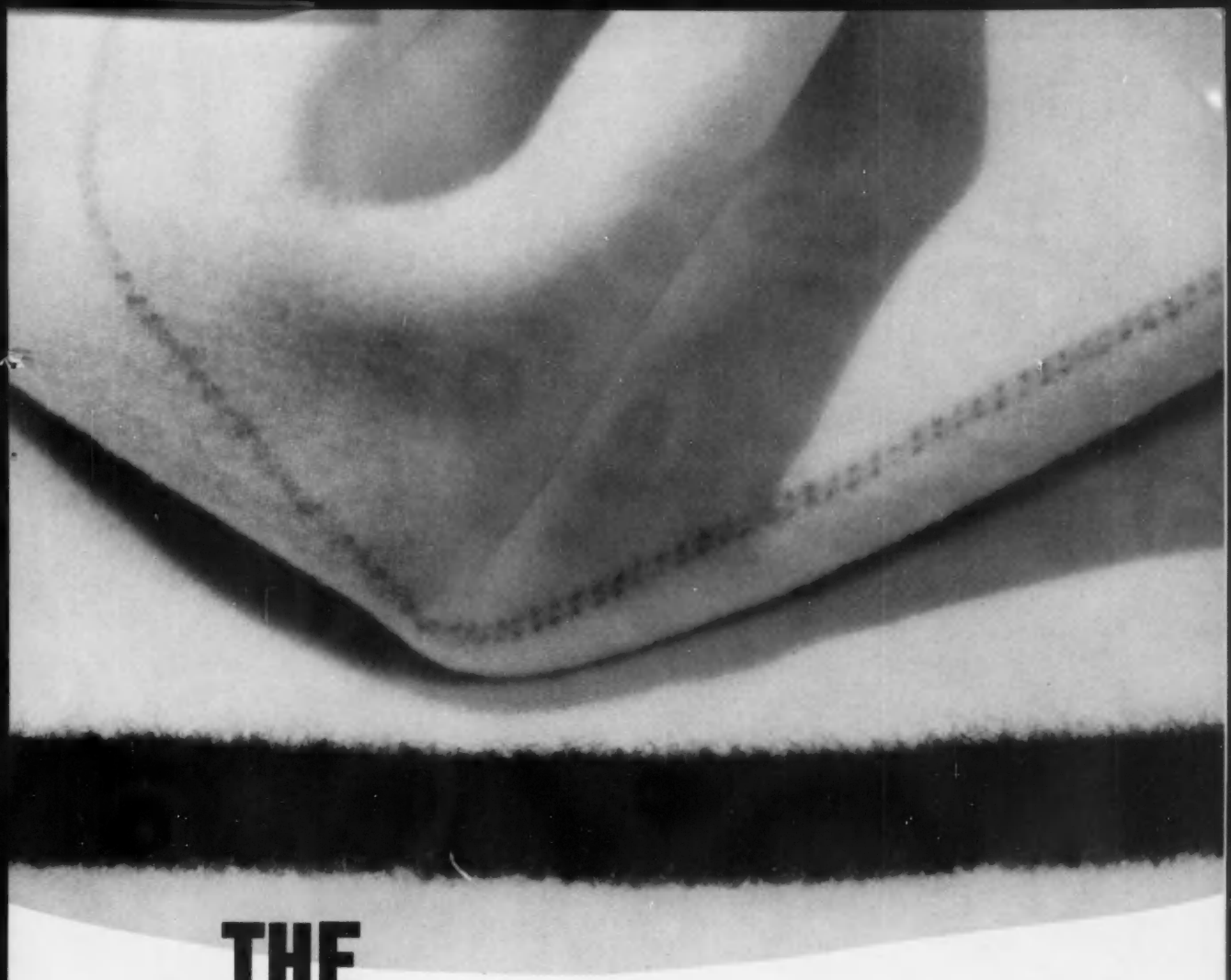
Reel designs include spool starters, rope systems, spool brakes, stationary or oscillating doctors, as well as automatic operating features.

*Both paper machines in this mill have new reels by VALLEY.*

*write* ..... **VALLEY IRON WORKS CORP.**

Subsidiary of Allis-Chalmers Manufacturing Co.

**Appleton, Wisconsin**



# THE MARK OF THE BEST IN FELTS

The blue and red stripes on this Super Plate Press Felt have identified all Huyck felts for close to 90 years.

No other feltmaker has come forward with so many "firsts" in felt-making and felt services as Huyck. No other felt has ever offered more advantages and economies.

Look for these familiar blue and red stripes on your felts and felt packages—THE MARK OF THE BEST IN FELTS *for your machines.*

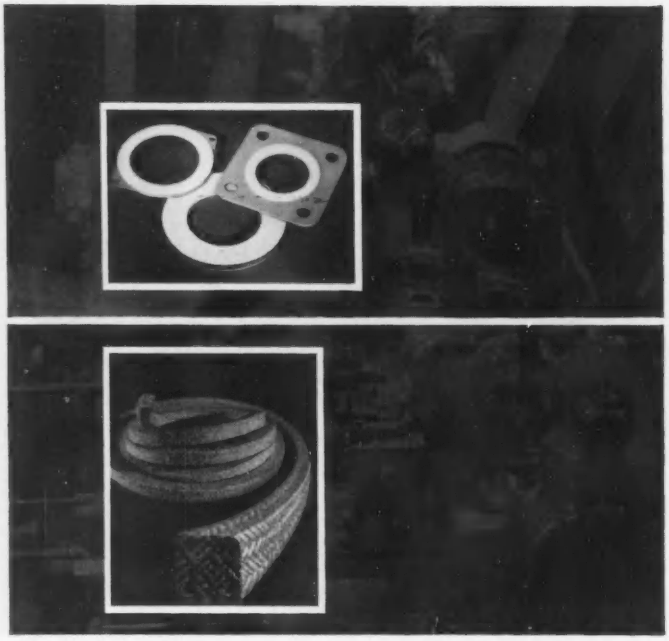
HUYCK FELTS

Huyck Felt Co.,
Rensselaer, N. Y.;
Alicaville, Ala.;
Division of F. C. Huyck & Sons.
In Canada: Kenwood Mills Ltd.,
Arnprior, Ontario

## NEW HUYCK FELTS ★ INDUSTRIAL FABRICS

FIRST IN QUALITY • FIRST IN SERVICE SINCE 1870

# ENGINEERED TEFLON* PRODUCTS for Paper Mills



For positive sealing on process equipment at temperatures from −110°F to +500°F, Garlock Teflon-jacketed Gaskets (top), LATTICE-BRAID Teflon Packing (bottom) resist chemical action but will not harm materials being processed.

**For positive sealing that withstands—but does not contaminate—reactive liquors and chemicals, use Garlock Teflon-jacketed Gaskets and LATTICE-BRAID† Teflon Packings.**

**For glass-lined process equipment, piping, flanges, and fittings,** Garlock Teflon-jacketed Gaskets give you the advantages of using Teflon without sacrificing resiliency and deformability. Garlock offers Teflon-jacketed gaskets in four basic designs—slit envelope, milled envelope, formed shield, and double jacket. Once you've selected the design best suited for your application, choice of filler material and thickness of the gasket becomes extremely important. Here, too, Garlock has a material for every operating condition—for high pressures, a corrugated stainless steel filler is suggested. Where the application is for low bolt loads, a rubber filler should be sandwiched between woven asbestos cloth. Cork, rubber, asbestos are just a few of the filler types available. Catalog AD-154.

**For pumps and valves,** Garlock LATTICE-BRAID Teflon Packings offer outstanding strength and long life. Less gland pressure is required to effect an adequate seal, resulting in longer sleeve and packing life, less downtime and maintenance. LATTICE-BRAID has no single outer braid or cover; thus it holds together far beyond the limits of ordinary braids. Add to these features the advantages of Teflon: chemically inert to corrosive materials; is non-contaminating, non-adhesive; extremely low coefficient of friction. Together, these advantages result in the finest soft packing available. Catalog AD-131.

**Talk over sealing problems** with your local Garlock representative. He can help you reach a sound economical solution. For prompt service call him at the nearest of Garlock's 26 sales offices and warehouses throughout the U.S. and Canada. Or, write for catalogs indicated.

# GARLOCK

The Garlock Packing Company, Palmyra, N. Y.

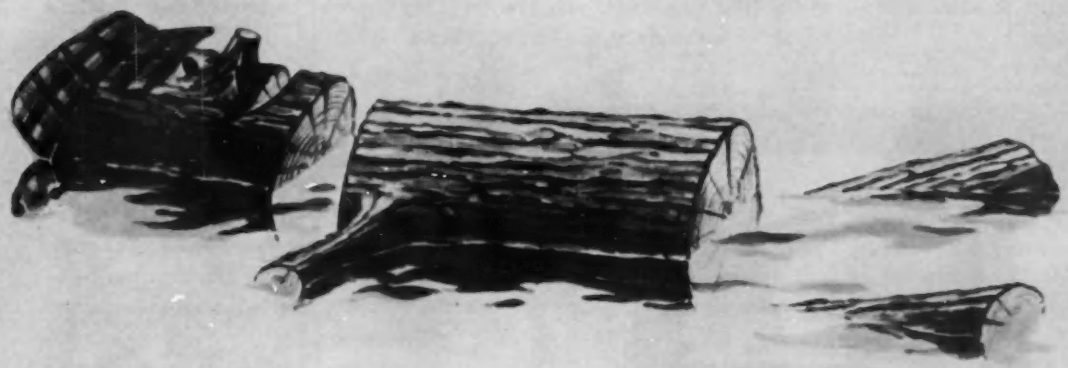
**Canadian Div.:** The Garlock Packing Company of Canada Ltd.

**Plastics Div.:** United States Gasket Company

**Order from the Garlock 2,000 . . .** two thousand different styles of Packings, Gaskets, Seals, Molded and Extruded Rubber, Plastic Products

*DuPont Trademark for TFE Fluorocarbon Resin
†Registered Trademark

# . . . PENNSALT CAUSTIC PAYS OFF IN PULPING



Supplying the pulp and paper industry with quality caustic soda has been a Pennsalt specialty for over half a century. Our customers like the personalized service they get . . . the dependable delivery they can count on, by barge, rail or truck, from modern Pennsalt plants and shipping centers. Our Technical Service Department is always ready with experienced aid on handling, storing and using your caustic. Call our nearest sales office. Industrial Chemicals Division, PENNSALT CHEMICALS CORPORATION, Three Penn Center, Philadelphia 2, Pa.

*See our complete listing in Chemical Materials Catalog*

**Industrial Chemicals Division**

SALES OFFICES: CHICAGO • DETROIT • NEW YORK • PHILADELPHIA
PITTSBURGH • ST. LOUIS • APPLETON • ATLANTA

PENNSALT OF WASHINGTON DIVISION, TACOMA • PORTLAND
INDUSTRIAL QUÍMICA PENNSALT, MEXICO CITY

**Pennsalt Chemicals**
ESTABLISHED 1850

PENNSALT CAUSTIC SODA is made at Calvert City, Ky., Portland, Ore., Tacoma, Wash., Wyandotte, Mich., and Mexico City

# *what to tell the board:*

Alert mill operating management people already see the boom coming. Production is creeping up, but it's the rate increase that bears watching. They see tomorrow's need clearly, but the Board of Directors has been burned before. What are some "safe" things to say?

1. Population growth alone will use up 120% of today's paper mill capacity by 1962.

2. The mill equipment that creates profits also limits profits.

3. Paper machine capacity can often be increased substantially by selective replacement alone.

4. New equipment pays off immediately in improved quality, reduced maintenance, and the ability to change grades to meet the market.

5. The most profitable equipment has been engineered recently and therefore incorporates machine design advances.

6. Equipment prices will never be lower than they are today; deliveries will never be shorter.

Some progressive mills have already said these things—and are already buying equipment. Many of them are buying from the well-engineered Patton line.

The Patton Manufacturing Company, Inc., Springfield 4, Ohio.

# Trends

**February Operating Rates 97% and 95%**

During February U. S. paper mills ran at 97.3% of capacity (Feb. 1959 was 90.5%) and board mills at 95% (Feb. 1959 was 94%).

**Woodpulp Output and Exports Up**

U. S. woodpulp output in January was 7% above the first month of 1959 according to the U. S. Pulp Producers Assn. Domestic shipments were up 1% and exports up 30% over January of last year.

**Profit Gains Modest for 1960**

Profit gains this year are not likely to match 1959 predicts Standard & Poor's Paper Industry Survey. With only moderate profit gains expected during 1960, dividends will probably continue at present levels through much of the year, states the Survey.

**Folding Box New Orders Lag**

New orders placed for folding boxes in January 1960 were off 0.6% in dollar volume and 3.3% in tonnage from those of January 1959.

**Waste Paper Mixed to Weak**

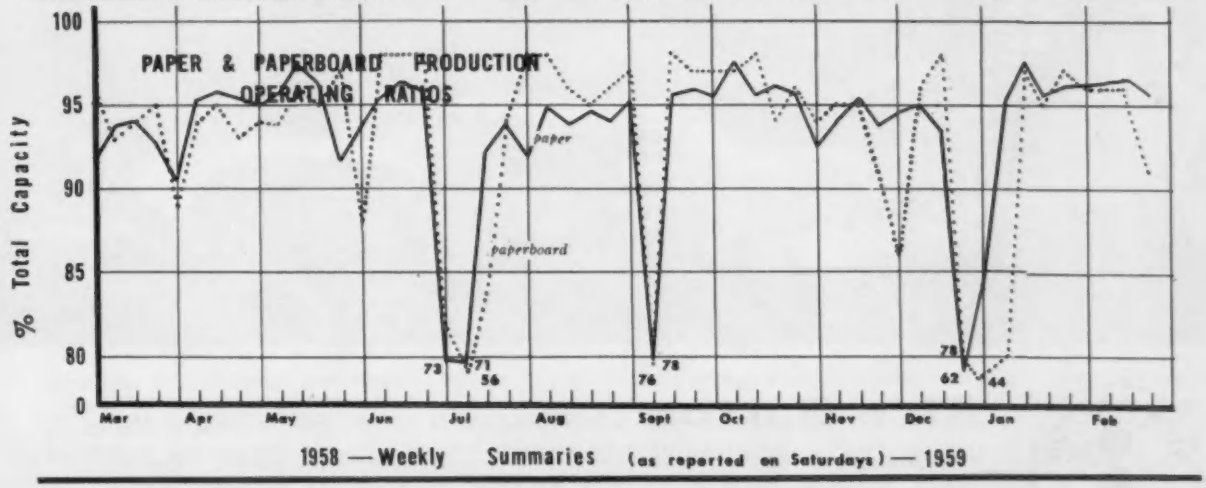
Waste paper markets continue in an uneven state around the country. Prices and demands vary from quite firm to soft. First of the month price drops for a number of the better grades in the Boston and New York areas are still in effect.

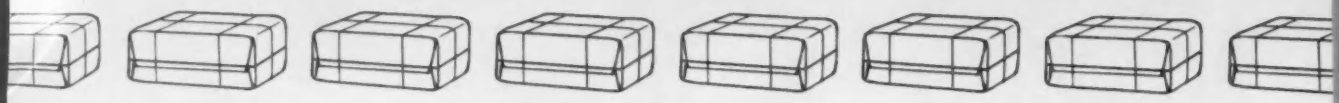
**Merchant Sales Up Moderately in January**

Merchant sales of fine papers in January were 0.9% above December and 4.4% over January last year according to NPTA. Sales of wrapping paper in January were 8.7% below December but 2.9% above January 1959.

**Newsprint Price Unchanged in 3 Years**

It is now three years since the last newsprint price increase of only 4%. The present price of $135 per ton is unlikely to be changed this year in the face of the present excess capacity.





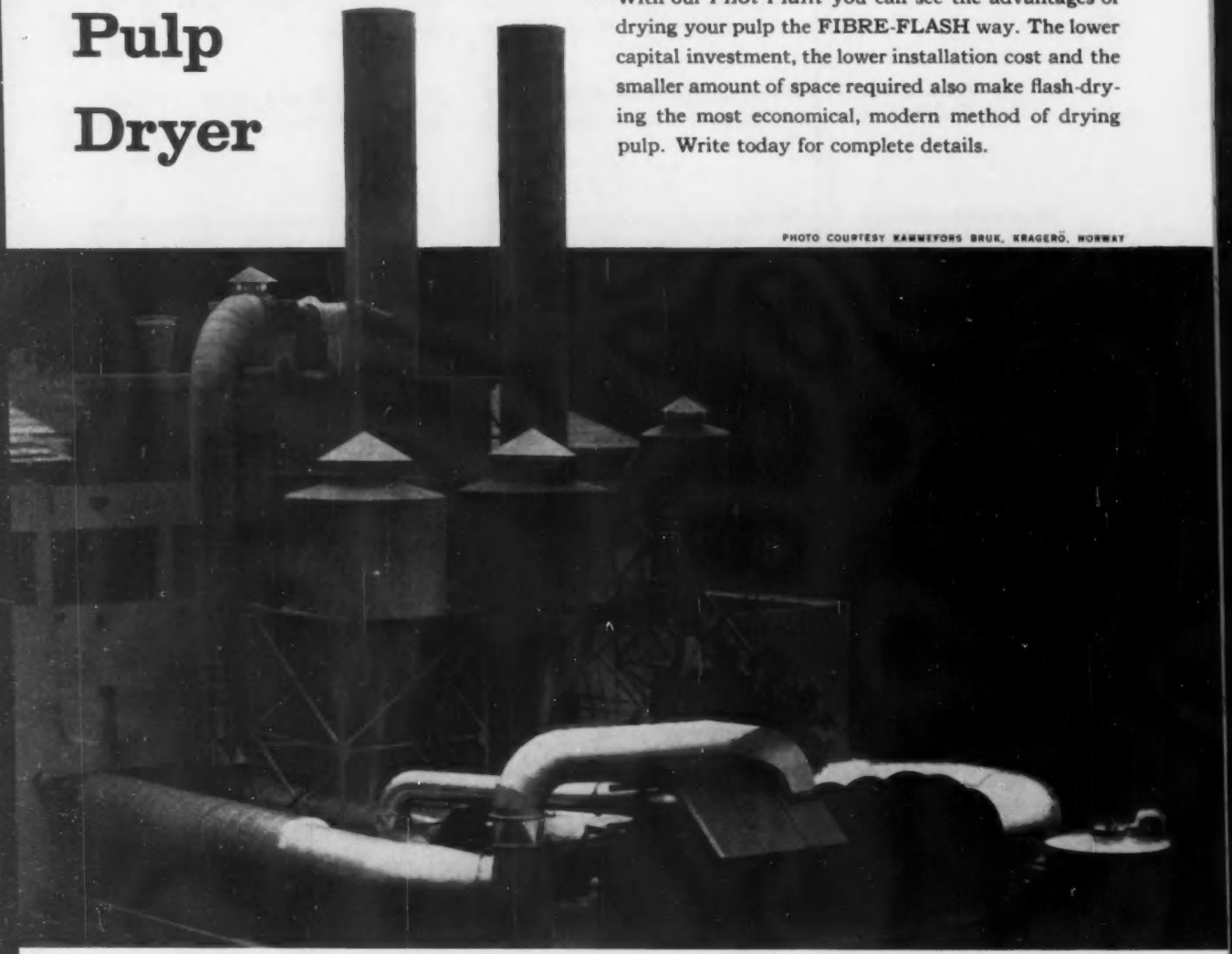
# Produce Pulp at less cost per ton with Rice Barton's Fibre-Flash Pulp Dryer

Within 100 mi. of Oslo this pulp mill is producing 100 T.P.D. at impressively low costs.

From stock chest to baler the **FIBRE-FLASH** system is mechanically far simpler, has a minimum of moving parts and costs less to operate and to maintain than conventional pulp dryers. It conserves every physical characteristic of pulp and is currently being used successfully for both groundwood and chemical pulps.

With our *Pilot Plant* you can see the advantages of drying your pulp the **FIBRE-FLASH** way. The lower capital investment, the lower installation cost and the smaller amount of space required also make flash-drying the most economical, modern method of drying pulp. Write today for complete details.

PHOTO COURTESY KAMMEFORS BRUK, KRAGERÖ, NORWAY



**Rice Barton** CORPORATION • WORCESTER, MASS.

FOURDRINIERS, PRESS SECTIONS, DRYER SECTIONS, CALENDERS AND SUPERCALENDERS, REELS, WINDERS, HEAD BOXES, SIZE PRESSES, BREAKER STACKS, DIFFERENTIAL DRAW CONTROL DRIVES AND CONE PULLEY DRIVES, PULPING EQUIPMENT, HIGH VELOCITY AIR DRYERS, TRAILING BLADE COATERS, FIBRE-FLASH DRYING SYSTEMS

PAPER TRADE JOURNAL

WEEK OF MARCH 14, 1960

## Moraine Paper Mill to Triple Production

An expansion program that will triple the production capacity of the Moraine paper mill at West Carrollton, Ohio, has been announced by Kimberly-Clark Corp. The expansion calls for the installation of a No. 2 paper machine at the Moraine Paper Co. division of American Envelope Co., which Kimberly-Clark acquired in February of 1959.

New buildings included in the program, having a combined area of about 200,000 square feet, will nearly double the floor space of the Moraine mill. A new paper machine will be erected in an existing area in the present machine room. It is designed to produce a sheet 168 inches wide in bond and offset grades.

A waste paper and pulp storage room and a de-inking plant, with a combined space of 100,000 square feet, will be constructed at the south end of the present building, it was reported. A finished paper and shipping storage building of about 89,000 square feet will be built at the north end of the present building.

Plans also call for the construction of a clay unloading shed and an addition to the power house to provide space for a new boiler. Construction will get under way in spring with completion scheduled for late 1961.

American Envelope Co. produces a wide variety of envelopes, fine stationery, envelope paper and other business papers and operates an envelope division at West Carrollton and the Karolton Envelope Co. in Chicago.

## St. Regis to Erect New Bleach Plant at Rhinelander

A continuous bleach plant with a maximum capacity of 120 tons of bleached stock per day will be built this summer at the Rhinelander Division of St. Regis Paper Co. The new bleach plant will be erected on the site of the old bleach liquor plant at Rhinelander, Wis. The three-stage plant, being built to meet the growing demand for higher brightness pulp, will be 90 feet wide and 80 feet high. Approximately 150 tons of structural steel will be covered with transite siding, similar to Rhinelander's new boiler house.

The three stages of the new plant are: first stage—chlorination up-flow at three per cent consistency; second stage—caustic up-flow at three per cent consistency, or as an alternate method, 12 per cent consistency down-flow; third stage—hypochlorite down-flow at 12 per cent consistency.

Two unbleached stock storage chests with a maximum capacity of 30 tons at six per cent consistency will be ahead of the first stage. Water extractors ahead of these chests will raise the consistency of the stock from the screen rooms to six per cent. Centrifugal cleaners will be installed between the hypochlorite stage tower and washer.

Plans also include two high-density storage chests with a capacity of 50 tons of 12 per cent stock. There will also be two small blending tanks to bring the stock consistency down to three per cent for use in the mill.

Rhinelander's new building will have a separate ventilating system to maintain building pressure. The tile chests will require about 324 tons of tile (8 carloads). Fifty-eight electrical motors will be installed with about 1500 h.p. connected capacity. Water usage in the new plant will be approximately 35,000 gallons of fresh water per ton of bleached stock.

Target date for completion of the new plant is early in September.

### Hudson Not Planning To Acquire Brown Co.

Widespread rumors that Brown Co. was to be acquired by Hudson Pulp & Paper Co. are without foundation, W. Mazer Hudson president, told PAPER TRADE JOURNAL. The Brown Co. stock has been extremely active and it is reliably reported that T. M. Evans, H. K. Porter Co. (and Crane Co.) have acquired 200,000 shares, nearly 10 per cent of the stock.

L. J. Whittemore, Brown chairman, has announced that the company expects to appoint a new president shortly. The position has been vacant since the resignation of A. E. H. Fair last September at the conclusion of his five year contract.

### Inglis Buys Pusey & Jones

The United States District Court for Delaware has confirmed Pusey & Jones sale of all patents, drawings, rights to do business, raw materials, inventory of parts, work in process, orders, etc. (in fact, all assets other than real estate, buildings, machinery, equipment, etc.) to John Inglis Co., Ltd., of Toronto.

Inglis will replace the trustee and the Pusey and Jones organization as the source to contact for parts, repairs, rebuilds, new machines, etc. Sidney G. Briscoe, formerly vice president in charge of sales of Pusey and Jones, is now the U. S. sales representative of Inglis. His local address is 521 West 39th Street, Wilmington, Del.

### Chemical Fine Paper Moves New York Offices

Chemical Fine Paper & Board Division of Standard Packaging Corp., Holyoke, Mass., has announced that its New York sales office has moved to the Standard Packaging Corp. executive offices at 200 East 42nd Street from 19 West 44th Street, N. Y. Howard A. Casey is the New York manager of the firm.

## Expansion Program Planned For Finch, Pruyn

Highlights of the projected 1960 modernization and improvement program of Finch, Pruyn and Co., Inc., Glens Falls, N. Y. include completion of the office building addition, a new digester to increase neutral sulphite pulp manufacturing capacity, a new size press on No. 2 paper machine to broaden ability to make surface coated offset and bond papers, and additional drying capacity on the three paper machines.

A new sulphur burner is now in use in a new process enabling the company to manufacture a continuous supply of sodium sulphite cooking liquor. The addition now under way to house an additional digester and auxiliary equipment was made necessary by the growing demand for papers manufactured with neutral sulphite pulp.

In the machine room a high-capacity overhead traveling crane system has been installed to handle all heavy pieces of equipment during wire changes. Lumpbreaker rolls and additional vacuum pump capacity have recently been installed on all three paper machines.

An automatic conveying system in the finishing room transports large rolls of paper to the rail siding. The storage building has been rebuilt for paper storage and stock area for cut sizes. A new hydraulic press trimmer has been erected in the converting department, to tie in with the Brackett trimmer and Hayseen ream sealer.

## Scholarship Available

A scholarship in the amount of $750 is offered by PAPER TRADE JOURNAL to a student who wishes to enter the University of Maine to major in pulp and paper technology. This is a continuing grant available in the freshman and sophomore years. The main purpose of the scholarship is to enable a student to major in pulp and paper at the University of Maine who might not otherwise be able to do so. Therefore the financial need of the student will have an important bearing on the choice of the recipient, who will be selected by the Freshman Scholarship Committee of the University of Maine.

Application forms for the PAPER TRADE JOURNAL scholarship should be requested from the Director of Admission, University of Maine, Orono, Me. Early application is advisable.

# LTI To Present Two-Week Summer Course

The Department of Paper Technology at Lowell Technological Institute this year again will present a two-week summer course in "Paper —Its Properties and Uses" with the endorsement of the Boston Paper Trade Ass'n. and the New England Paper Merchants Ass'n. It will be given June 6 to 17 at LTI by Professors Norwood H. Keeney, Edward M. Engel, and Charles J. Higgins of the paper technology faculty.

Purpose of the course is to present in a practical way information about papermaking and the properties of paper in order to determine the value and suitability of paper and paperboard for various end uses. Lectures will be followed by group discussions and plant visits. Several informal evening discussions will be held with leaders from nearby industry participating.

Enrollment for the course is limited, and letters of application must be sent before May 10 to Paper Summer Course, Lowell Technological Institute, Lowell, Mass., with a deposit of $10 which will be returned if the application cannot be accepted. Fee for the course including tuition, room, meals, books, and transportation on field trips is $225. For commuters the fee is $150.

## Canadian Fine Paper Output Off in January

Canadian fine paper production in January was 22,175 tons, off 4.7 per cent from the 23,016 tons produced in the same month last year.

Shipments for the month were ahead 3.7 per cent at 22,795 tons as against 21,975 tons in January last year.

Included in this year's total were exports of 1,335 tons, up from 1,232 tons in 1959.

Coated paper output in January was 2,524 tons (2,671 tons in 1959) while shipments were 2,639 tons (2,535 tons).

## Canadian Paperboard and Woodpulp Production Up

Canadian paperboard production in January was 72,332 tons, up slightly from the 71,078 tons produced in January last year. Exports for the month, however, gained substantially at 7,210 tons as compared with 3,900 tons a year ago. Domestic paperboard use was 60,605 tons, down slightly from 62,541 tons in January last year.

Canadian woodpulp production in January was 889,802 tons, up sharply from the year ago figure of 835,114 tons. Increased pulp consumption in the domestic production of paper and board was chiefly responsible for the gain.

Domestic consumption was 674,139 tons as against 637,305 tons in January last year. Pulp exports for the month were also ahead at 199,213 tons as compared with 197,518 tons last year.

## Bowater Board Plant to Begin Operation in June

Production of smooth-on-both-sides hardboard at the new $7,000,000 plant of Bowater Board Co., Catawba, S. C., is scheduled to get under way early in June, John G. Robinson, mill manager has announced. The plant will be the first hardboard mill in the eastern part of the country.

Bowater Board will be manufactured by a relatively new air—or dry—process, which produces a smooth-on-both-sides characteristic and other qualities expected to be particularly attractive to the furniture industry.

## Paper and Paper Board Production

The American Paper and Pulp Association reported the ratio of the United States paper production to mill capacity for the week ending February 27, 1960, at 95.6 per cent compared with 98.0 per cent, revised for the preceding week. The ratio was 93.0 per cent for the corresponding week a year ago.

The National Paperboard Association reported the paperboard production ratio for the week ending February 27, 1960, at 91 per cent, compared with 96 per cent for the preceding week and 92 per cent for the corresponding week a year ago.

*(Detailed statistics on page 72)*

# PAPER PEOPLE

W. D. Duryea, II

## Duryea To Retire From Penobscot Post

Eugene H. Clapp, president of Penobscot Chemical Fibre Co. of Boston, Mass., and Old Town, Me., has announced that William D. Duryea, vice president in charge of sales and purchases, will retire on April 1 under the company's mandatory retirement plan. Mr. Duryea will, however, continue to serve on the board of directors.

Mr. Duryea has been with Penobscot since 1921 in a sales capacity and his integrity, ability, and friendliness have brought him the reputation not only of being the dean of pulp salesmen but also of being one of the best loved and respected men in the industry. He was elected vice president in charge of sales and purchases on January 3, 1943, and has been a member of the board of directors since 1934.

William D. Duryea II, sales manager, will succeed his father on April 1 in full charge of selling and purchasing. He is a graduate of Tufts College. After service with the Marines, he became associated with Penobscot in October of 1952.

The company has also announced that Joseph A. Clapp, Jr., joined the Penobscot sales team on February 1. He has been associated with one of Penobscot's subsidiaries (Tilestón & Hollingsworth Co.) in a sales capacity, selling to the jobbing trade outside of New England since March of 1956. Previous to this time he sold paper for Hollingsworth & Whitney Co.

## Le Roux Succeeds Baker At Weyerhaeuser

Russell J. LeRoux, of Everett, Wash., has been named manager of manufacturing, pulp and paperboard division of Weyerhaeuser Co. Mr. LeRoux's appointment will be effective April 1. He succeeds R. E. Baker, who leaves the company to join Southwest Forest Industries of Phoenix, Ariz.

Mr. LeRoux joined Weyerhaeuser in 1941. He came to the northwest from Consolidated Water Power and Paper Co.

He has served as manager of the company's Everett pulp operations since 1942. In his new position he will be in charge of pulp and paper manufacturing at company mills in Springfield, Ore.; Cosmopolis, Longview and Everett, Wash.

R. S. Fisher

## National Fibre Appoints Administrative V-P

The appointment of Roy S. Fisher as administrative vice president of the National Vulcanized Fibre Co. has been announced.

In addition to his previous responsibilities as sales vice president, Mr. Fisher will be responsible for the industrial relations, order-service, traffic and marketing departments of National.

A graduate of Pennsylvania State University, Mr. Fisher has been associated with the vulcanized fibre industry since 1922, when he was with the Delaware Hard Fibre Co.

## Howard Paper Mills Names Safety Supervisor

Robert M. Brown, assistant superintendent of the Aetna Paper Co. division of Howard Paper Mills, Inc., has been appointed safety supervisor of the division, according to Fred L. Kimmel, division manager.

Raymond McCormick

## Continental Can Names Gen. Supt. for Augusta

The appointment of Raymond McCormick to the post of general superintendent of the Continental Can Co. bleached pulp board mill in Augusta, Ga., has been announced. The mill is at present under construction and the target date for start of operations is October of this year.

Mr. McCormick brings 27 years of paperboard manufacturing experience to his new job. He spent 22 years with the National Container mill in Jacksonville, Fla.

## Two Retire at I-P After 62 Years

Frank E. Chapman and Harry Farrell have retired from International Paper Co. after achieving the longest records of service ever attained by any company employee.

Both men joined the company when it was founded in 1898. They were employed for 62 years before retiring at year's end.

Mr. Chapman spent many years as mill agent at several different mills of the company. He is well known to suppliers in the trade having served since 1927 in the company's New York purchasing department.

Mr. Farrell spent his entire career in International Paper's New York office. Following assignments in sales and in the secretary's department, he worked in the engineering department and later transferred to the core and wrapper department.

## Hurlbut Becomes Mac Sim Bar President

Edward J. Hekman, president of the United Biscuit Co. of America, announces that Lewis W. Dickinson, president of the Mac Sim Bar Paper Co., Otsego, Mich., will retire March 31. W. Elsworth Hurlbut, executive vice president and sales manager will succeed Mr. Dickinson as president effective April 1.

Mr. Dickinson has been with Mac Sim Bar since 1938, coming to Otsego from Three Rivers where he was affiliated with the former Eddy Paper Co.

He became president of the Mac Sim Bar papermill on the death of C. M. Sisson in August of 1956. He has also been serving as resident manager. Mr. Dickinson states that he has made no immediate plans for the future.

Mr. Hurlbut, a graduate of Otsego High School, has been with the Mac Sim Bar Company since 1935.

Mac Sim Bar, more than 50 years of age was named by taking the first syllable of each of its founders' names—McClellan, Simpson, and Bardeen and is a box board mill. In 1948, it became a division of the United Biscuit Co., but still retains the name of Mac Sim Bar.

## Boise Cascade Names Engineering Div. Head

Keith Miller has been named head of the Boise Cascade Corp. central engineering division, Walla Walla. Wash. Mr. Miller has been with Boise Cascade about two years. He will head the division which handles engineering work for B-C sawmills, pulp and paper division and container plants. He succeeds W. O. Hisey who has been transferred to England.

## Bower Appointed Hoquiam Paper Mill Head

Ray F. Bower has been appointed resident manager of the paper mill of the Grays Harbor Paper Co., Hoquiam, Wash.

Mr. Bower will move from the Erie mill of Hammermill Paper Co. to Hoquiam to assume direct management and to assist in the completion of the installation of the company's second paper machine and related papermaking facilities. This new installation, to be completed in late 1961, will increase the plant's capacity from 30,000 to 70,000 tons annually.

**Carl Magnus** "on the Ginza," Tokyo's Fifth Ave., during a recent visit to Japan.

## Magnus Completes Korean Projects, Returns to U. S.

Having recently completed two important projects for the United Nations Korean Reconstruction Agency, Carl Magnus of Johnson, Vt., has recently returned to his pulp and paper industry consulting practice in the U. S. Well known in this country, Mr. Magnus has broad experience in our industry.

In Korea, he played a large part in getting two pioneering paper mills in operation. One was the first bond paper mill in Korea for which Mr. Magnus had the responsibility for installing equipment, organizing and training personnel, and directing operations. The second project, potentially the largest paper project in Korea, involves the manufacture of containerboard, cartons, kraft wrapping, test bag papers and bags. In addition to the above mentioned duties, he was also responsible for general management of operations on this project.

Just prior to his return to the U. S., Mr. Magnus spent ten weeks in Japan studying its paper industry. He revisited a number of Japanese executives and technicians whom he had first met several years earlier at a mill in Ohio where he was part of the management team. At that time they were studying the U. S. paper industry.

As a consultant Mr. Magnus has been involved in projects such as: a study of natural resources of the Rocky Mountain states; engineering and organization of a NSSC pulp mill for nine point; design and organization of a large newsprint mill; industrial technical advisor. His experience includes management positions in mills making bleached sulphite pulp, folding box boards, fine papers and specialty papers.

## Butler Named to Nekoosa-Edwards Board

Paul Butler, president of Butler Co., Chicago, has been named to the board of directors of Nekoosa-Edwards Paper Co., Port Edwards, Wis., a leading producer of business and printing papers.

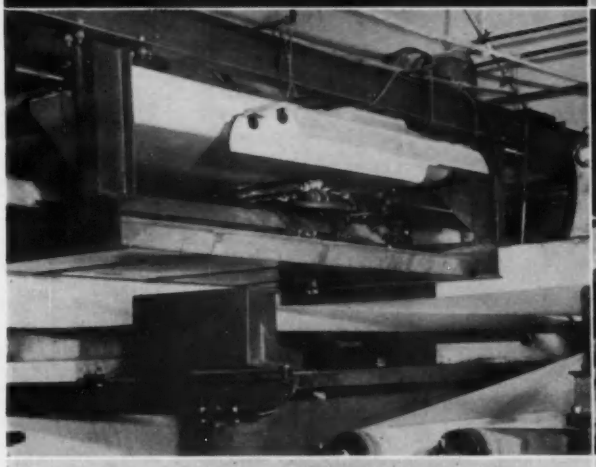
The Butler Co., which Mr. Butler

"No, No! Not Goldenrod! Gives me hayfever."

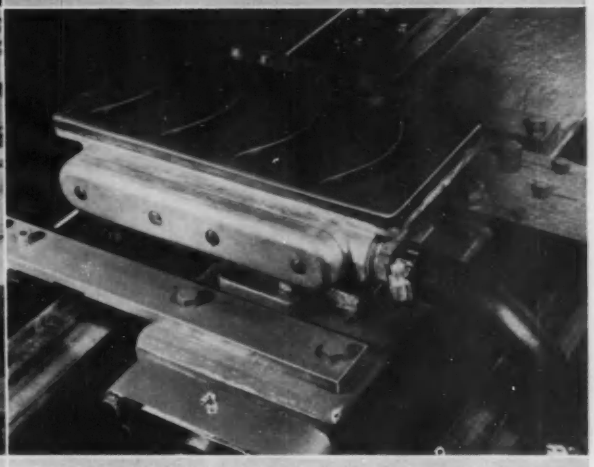
# *Shut Down on* SHUTDOWNS AND SLOWDOWNS

## Equip EVERY press felt and wet felt with a VICKERY FELT CONDITIONER

**This Vickery Conditioner** with four conditioning boxes on a big, high speed book machine felt is of the new, self-contained traveling header design. It is equipped with hydraulic drive.



**This Vickery Conditioner** on a machine making top grade writings is saving two or three shutdowns a week.



**Vickery Wet Felt Conditioners** are doing an equally effective, money-saving job of reducing cylinder machine shutdowns. Top and bottom felts are continuously clean and open. Crushing is often avoided. Shower volume is minimized. Felt life is often greatly increased. Machine speed is maintained right through the week.

With today's production demands and high operating costs, you can no longer afford mid-week shutdowns for felt wash-ups. And taking the weights off the presses and slowing down toward the end of the run is likewise too costly.

Vickery Felt Conditioners keep the felts continuously clean and absorbent throughout the run, whatever the size and speed of the felt.

Don't let a single felt go dirty. Investment in Conditioners never produced such handsome returns as it does now!

**BIRD MACHINE COMPANY**

**SOUTH WALPOLE, MASS.**

REGIONAL OFFICES: EVANSTON, ILLINOIS
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Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

Product of PORT HURON
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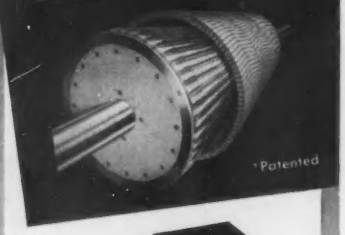
Join the parade of leading mills saving money with JONES ADAPTA-PLUG* and FULBAR FILLINGS

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D JONES CORP member BELOIT group PITTSFIELD MASS.
Jones
PULP MILL EQUIPMENT AND STOCK PREPARATION MACHINERY

has headed for many years, is a major distributor of printing papers and is the parent organization for various Butler enterprises including Butler Aviation Division and the Oakbrook Division, as well as numerous paper distribution outlets throughout the United States.

## Eastern Names Koon To Head Brewer Plant

Appointment of Charles M. Koon to the newly created position of resident manager of the Brewer, Me., pulp and paper mill of the Eastern Fine Paper and Pulp Division, Standard Packaging Corp., has been announced by Frank A. Knight, division manager. Donald G. Griffee continues as resident manager of the Eastern Division's Lincoln, Me., mill.

Prior to his promotion, Mr. Koon had been production manager. He joined the Eastern organization as technical director in September, 1958. Prior to that time, he had spent six years with Oxford Paper Co., Rumford, serving as technical service supervisor. Earlier, he had been a research associate at the Institute of Paper Chemistry, Appleton, Wis. He is also a former technical superintendent of Munising Paper Co.

Other promotions announced by Mr. Knight, all of which effect the Brewer mill, are as follows. Eldridge G. Stone to production manager—paper; Paul R. Coughlin to paper mill superintendent; Eben M. Whitcomb, Jr., to control superintendent; David R. Bernhardt to technical superintendent. Also, John R. Tardiff to chief inspector; Richard L. Crommett to assistant papermaking superintendent; Merritt J. Hayden to assistant finishing superintendent; Jenness M. Buck to maintenance engineer—paper; Robert P. Tapley to cost accountant.

## OBITUARIES

**Edward Tytus Gardner** 80, died at his residence in Oakwood, Fla., February 23. At the time of his death he was active with the Diamond National Corp. in New York.

Mr. Gardner was president of the Gardner Board and Carton Co. in Middletown from 1917 to 1954. That year he became board president until the firm's merger with the Diamond Match Co. in 1957.

**Henry P. Schmeer,** 85, former president of Schmeer Paper Box Co., died February 15 in Syracuse, N. Y.

Mr. Schmeer had been president of the Syracuse firm many years prior to the discontinuation of operations several months ago. He joined the company at an early age and had been with the company his father founded about 66 years. His brothers, Charles and William, served as officers with him.

**Lauri I. L. Durchman,** 72, a chemical engineer active in pulp and paper until his retirement last year, died February 10 in West Palm Beach after suffering a heart attack while vacationing there.

Born in Tampere, Finland, he earned his engineering degree in Germany, and was employed in pulp and paper mills in Finland and Russia until he came to the United States in 1927. From 1946 until his retirement a year ago, he had been with American Defabriator, Inc., in New York.

**C. I. McNair, Jr.,** 67, retired executive of The Northwest Paper Co., Cloquet, Minn., died February 11 following a lengthy illness. Mr. McNair, son of one of the founders of The Northwest Paper, became associated with the company in July, 1914, following graduation from Yale University.

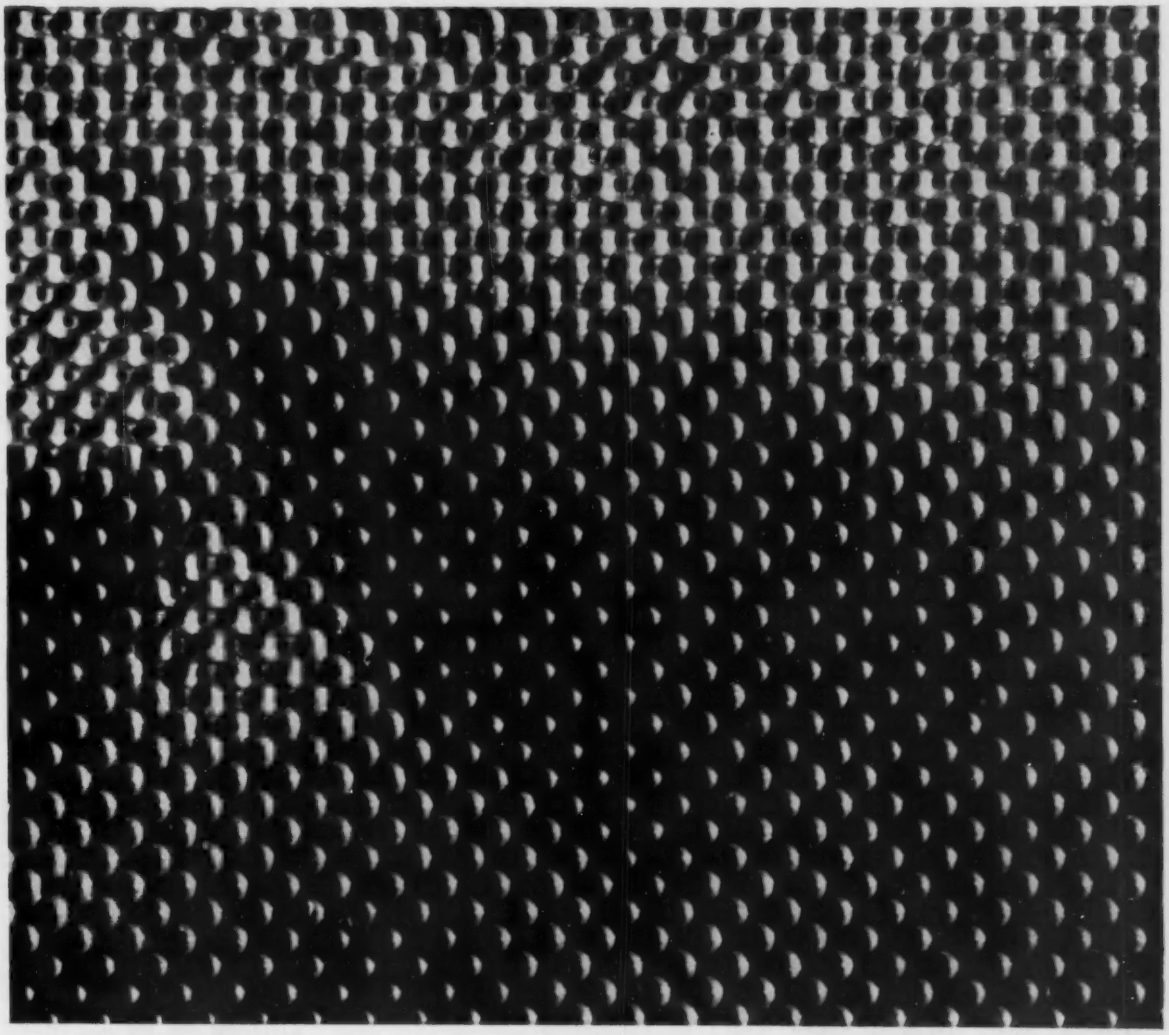
He served in various capacities and was vice president in charge of manufacturing from 1940 until his retirement in 1953.

**Edmund Tileston Mudge 2nd,** 64, president and principal owner of the Mudge Paper Co., died in his Ruxton, Md., home February 28. He had been ill for about eight months.

**Frederick H. Glanville, Sr.,** 83, retired purchasing superintendent for the Cocker-McKelwain Co., Holyoke, Mass., paper manufacturers, died at his home in Hartford, Conn., February 29 after a long illness.

**John Roslund,** Pacific Coast representative of the Asten-Hill Mfg. Co., died in Portland, Ore. Mr. Roslund had been with Asten-Hill for over 20 years representing them on the West Coast for the past 10 years.

DOW | LATEX



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• Exceptional Starch Compatibility

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# PJT ASSOCIATION NEWS

## Electrical Engineering Conf. at Florida Univ.

Aspects of Systems and Control in the paper and pulp industry will be part of the program heard by some 200 ranking electrical engineers and their industry associates when they assemble April 21 and 22 at the University of Florida, Gainesville.

The annual conference on Electrical Engineering as applied to the Pulp and Paper Industry is sponsored by the Pulp and Paper Industry Subcommittee of the American Institute of Electrical Engineers and is usually held on the campus of leading colleges and universities throughout the country.

The conference this year is being held at the University of Florida. The program promises a wide variety of technical papers to be presented by leading electrical engineers from the mills and associated industries.

Advance copies are not available. However, a conference booklet containing copies of all papers to be presented will be available at the time of registration.

C. H. Hudson, General Electric Co., Atlanta, Ga., is chairman of the AIEE Paper and Pulp Industry Subcommittee, E. K. Murphy, Rayonier Inc., Jesup, Ga., is vice-chairman and C. L. Eletson, Alton Box Board Co., Alton, Ill., is secretary.

## Gummed Industries Ass'n. Holds Technical Seminar

The Third Annual Gummed Industries Ass'n. Technical Section Seminar was held at the Hotel Roosevelt in New York City on February 25.

Keith H. Williams of the Mid-States Gummed Paper Division of The Minnesota Mining and Manufacturing Co. was unanimously elected chairman of the GIA Technical Section with Henry C. Hills of Nashua Corp. being elected to the post of vice-chairman.

For 1960 the Technical Section approved an expanded program calling for the establishment of subcommittees along product lines and the development and publication of a GIA Standard Test Brochure, the first copies of which will be released early this spring.

## Staff Changes Made At NPA and FBA

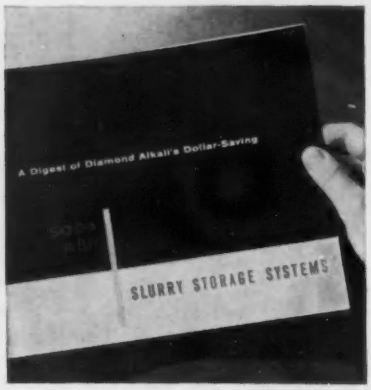
Frank H. Schmitt has been appointed secretary, Eastern Division, National Paperboard Ass'n. and Fibre Box Ass'n., replacing Ralph C. Kline who died February 10, 1960, and John J. Howard, has been named secretary, Pacific Coast Division, of both associations, replacing John J. Chess, who resigned February 15, Albert W. Luhrs, executive manager of NPA and FBA announced.

### "Look for the Label"

A concerted effort by major wrapping tissue manufacturers to acquaint distributors, paper merchants and consumers with the advantages of seeking the Tissue Ass'n. label on their cartons was announced at a recent meeting of the Wrapping Tissue Division of the Tissue Ass'n., Inc.

Coupled with information to distributors, merchants and consumers as to the significance of the guarantee provided by The Tissue Ass'n. label on wrapping tissue will be a plan to standardize carton markings, as to contents, grades and sizes to meet the requirements of U. S. Department of Commerce Simplified Practice Recommendations R46-55 and to simplify distributor and merchant handling, warehousing and identification for inventory control.

Protection of legitimate merchants and distributor's interests will be stressed as well as the need of consumers to be assured of full count, weight and proper grading, as promulgated by the National Conference of Weights and Measures officials. Certification is made by those manufacturers who are members of The Tissue Association and who use the Association label on each carton they manufacture.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shows you how to cut light soda ash storage space by 60%

**This booklet** is loaded with facts, photos and diagrams showing three alternate unloading systems now used by many plants.

These systems are coupled to a storage system based on the principle of increasing bulk density of light soda ash to save storage space.

By storing light soda ash as slurry, you can often save as much as 60% of the storage space required for dry storage. Diamond's Sales and Technical Service team is anxious to assist you in your consideration of this cost-lowering method of handling soda ash in your plant. Write for this booklet today.

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Please send free booklet, "Soda Ash Slurry Storage Systems."

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With their advanced design, sturdy construction, and conforming to latest valve standards, Powell Valves can be depended upon for consistently satisfactory service with little or no maintenance. If you have a valve problem or an unusual flow control condition in the handling of water, oil, gas, air, steam, corrosive fluids, our engineers will gladly help you solve it. Check with your nearby Powell Valve distributor—or write to us.

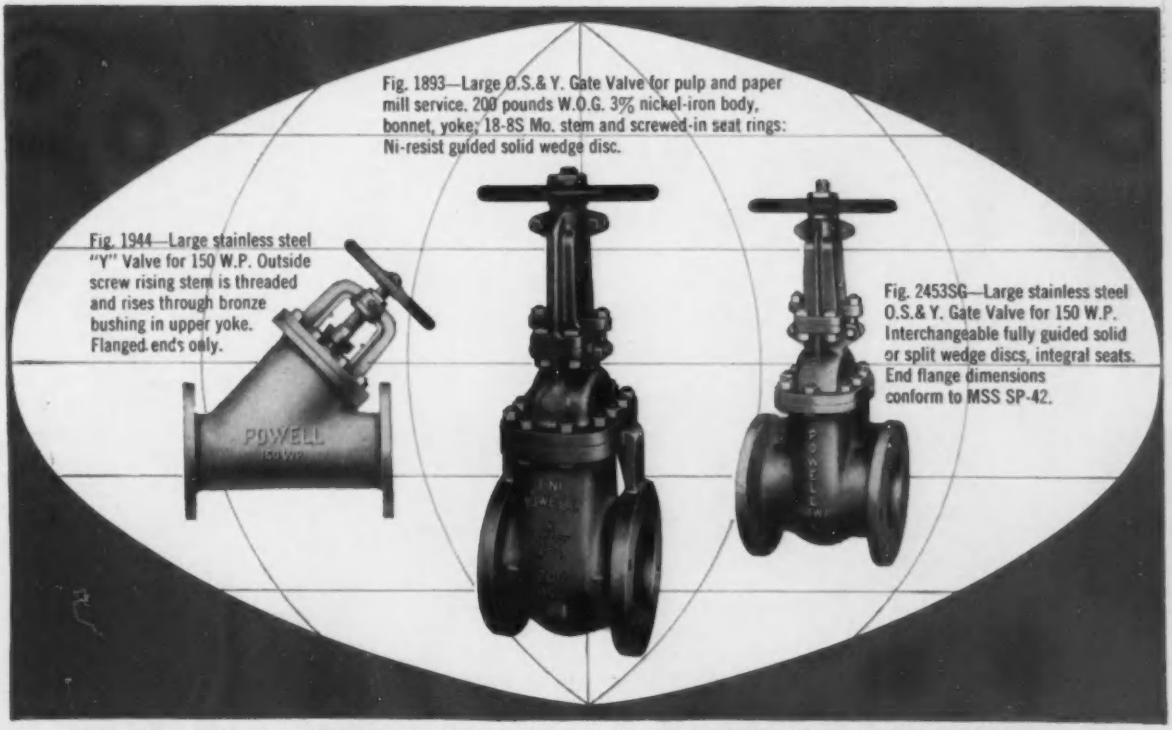
Fig. 1893—Large O.S.& Y. Gate Valve for pulp and paper mill service. 200 pounds W.O.G. 3% nickel-iron body, bonnet, yoke; 18-8S Mo. stem and screwed-in seat rings: Ni-resist guided solid wedge disc.
Fig. 1944—Large stainless steel "Y" Valve for 150 W.P. Outside screw rising stem is threaded and rises through bronze bushing in upper yoke. Flanged ends only.
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Fig. 2453SG—Large stainless steel O.S.& Y. Gate Valve for 150 W.P. Interchangeable fully guided solid or split wedge discs, integral seats. End flange dimensions conform to MSS SP-42.

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# PJT NEWS OF CONVERTERS

## Tag Institute Elects Officers, Gives Awards at Winter Meeting

George E. Phelps, secretary-treasurer of the Allen-Bailey Tag Co., Inc., Caledonia, N. Y., was re-elected president of the Tag Manufacturers Institute for 1960, at the TMI Winter Meeting.

Elected first vice president of TMI was G. G. Cornwell, president of The Denney Tag Co., West Chester, Pa. Leonard F. Gehrig, Mayor of Ennis, Tex., and vice-president-secretary of Ennis Business Forms, Inc., was named second vice-president.

In addition to the election of officers for the calendar year 1960 the Institute announced the winners of the initial TMI Unusual Tag Contest, an industry-wide competition to find the most unusual tags produced in each of three basic categories: Informative Tags, which promote products at the point of sale; Special Tags, which perform recordkeeping as well as other specialized duties; and Systems Tags, utilized by industry to record production data.

Winners of the initial awards were:

Informative Tags—Robinson Tag and Label Co., New York, N. Y.

Special Tags—The American Tag Co., Inc., Belleville, N. J.

Systems Tags—Allen-Bailey Tag Co., Inc., Caledonia, N. Y.

SYSTEMS TAG AWARD WINNER George E. Phelps (left), accepts Tag Mfrs. Institute Award on behalf of the Allen-Bailey Tag Co., from Institute executive director Carroll A. Greathouse (right) who is holding award-winning tag.

SPECIAL TAG AWARD. George E. Phelps (right) TMI president, presents the TMI Special Tag Award to D. M. Swett (left) who accepts award on behalf of The American Tag Co.

Another highlight of the three-day meeting was a seminar on Materials Cost Control, led by L. P. Bullat, International Tag & Salesbook Co., Chicago, Ill. Mr. Bullat outlined the various cost control methods now in use in the tag industry to make the membership more aware of the many factors which come under the heading of material cost control.

M. B. Weir, TMI counsel, addressed the membership on the new Internal Revenue Service expense account reporting requirements, and discussed the Food Additives Amendment to the Pure Food & Drug Act, and the Textile Fiber Products Identification Act.

The members voted to hold the next meeting at The Greenbriar, White Sulphur Springs, W. Va., on June 1-3.

## D. F. Wicks Named V-P at Raymond Bag

Deane F. Wicks has been appointed vice president in charge of marketing of the Raymond Bag Corp., Middletown, Ohio, according to J. R. Clements, president.

Mr. Wicks had previously been Eastern District sales manager in New York, N. Y., and currently is general sales manager for the company.

In his new position, Mr. Wicks will be responsible for all phases of market research and development as well as product development for the company. He will continue to make his headquarters in Middletown, Ohio.

## Randolph Paper Box Buys Folding Box Business

Randolph Paper Box Co., a division of Albemarle Paper Manufacturing Co., has purchased the folding box business of Consolidated Paper and Box Manufacturing Co., Inc.

This is the third major acquisition by Albemarle in the Richmond area within the past 12 months. Randolph Paper Box Corp. was acquired in April, 1959, and Richmond Container Corp., a corrugated shipping container plant, in September, 1959.

Consolidated was organized in 1909 and has operated continuously under the same management as a manufacturer of folding and setup paper boxes, and until June 1959 as a wholesale paper distributor at which time this business was sold to Southern Paper and Supply Co. of Richmond. This sale to Randolph does not include the setup box operation which Consolidated will continue at the same location with plans for expanded facilities.

Randolph, which manufactures cartons for tobacco, ice cream, textile, baking, meat packing and other industries, is the continuation of a firm by the same name founded in Richmond in 1832. Albemarle, the parent company, founded in Richmond in 1887, operates two paper mills, a water proofing plant, a multiwall sack plant, a folding box plant and a corrugated shipping container plant in Richmond; a kraft pulp mill and two paper mills in Roanoke Rapids, N. C.; a multiwall sack plant in Middletown, Ohio; and a paper shopping bag plant in Walden, N. Y. Albemarle's total sales for the current fiscal year are expected to be in the neighborhood of $40,000,000.

## Ewens Quits Milprint Post

Roland N. Ewens has retired as chief executive officer and board chairman of Milprint, Inc., but will continue as a director, chairman of the executive committee and a consultant.

Arthur Snapper, who has been president, was named as chief executive officer succeeding the board chairman.

## Mead Containers Sets Up Regional Offices

Growth of Mead Containers Division of The Mead Corp. has resulted in the establishment of four regional offices and certain changes in responsibilities at division headquarters in Cincinnati.

The four regional offices located in Memphis, Cincinnati and Toledo, Ohio, and North Bergen, N. J., will be headed by managers who will be responsible for the overall sales, production, and administrative functions in their assigned areas. At Cincinnati two staff managers will coordinate the administrative, cost control, manufacturing, sales, and marketing services for the division.

The southern regional office at Memphis will be under the supervision of Virgil C. Shutze, who until this appointment headed the division New York sales office. He will be responsible for sales and production of plants at Ft. Smith, Ark.; Memphis; Miami; and Atlanta. Mr. Shutze has been associated with the Mead organization since 1933 when he was employed as a salesman for Atlanta Paper Co., now the Mead Packaging Division. Morris Malmad. who has been manager of the Miami plant, will serve as his manufacturing manager.

William H. White, as manager of the midwest region with headquarters in Toledo, Ohio, will head manufac-

*(Continued on page 35)*

**Occasionally we are faced with the problem of getting technical material about pulp and paper translated into English. The problem is that the translation is often useless unless it is done by someone with good knowledge of our industry. A few of our readers will be interested to know that such a person is available. His name is H. Altosaar, Box 784, Cornwall, Ont. His languages are Norwegian, Swedish, Finnish and German.**

Log Debarker manufactured by Machine Products Co., Gadsden, Ala., makers of heavy equipment for the pulp and paper industries.

**This V-Belt Drive costs less,**

# takes shock loads chain couldn't handle!

***Another manufacturing problem solved by the high capacity of Gates Super HC V-Belt Drives...***

The makers of the Log Debarker shown above found that the chain drive on the debarker head could not always handle the shock loads characteristic of this operation.

To insure buyers of this machine top performance and freedom from down time, Machine Products Co. replaced the chain drive with Gates Super HC Drive.

Not only have they eliminated down time and replacement costs from shock-load breakage of the chain, the makers have also actually cut manufacturing costs because the Super HC Drive permits a smaller debarker head.

**Nation-Wide Engineering Service**

A Gates Distributor or Field Representative will show you how Super HC V-Belt Drives reduce sheave diameters 30% to 50%, reduce drive space up to 50%, and drive weight 20% and more. To learn more about Gates Drive Engineering Service ask him for a free copy of "*The Modern Way to Design Multiple V-Belt Drives*" or write the Gates Rubber Co., Sales Division, Inc., Denver, Colorado.

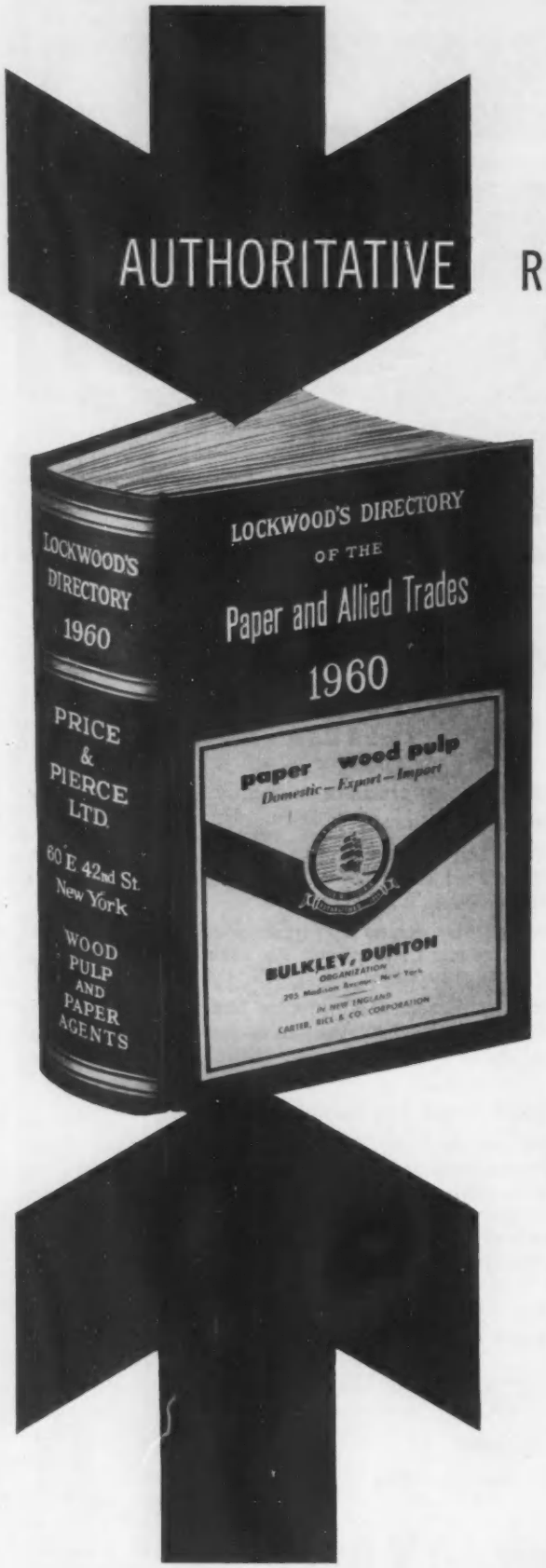
TPA 475

**The Gates Rubber Company,** Denver, Colorado
**Gates Rubber of Canada Ltd.,** Brantford, Ontario

Gates

*World's Largest Maker of V-Belts*

**Gates Super HC V-Belt Drives** same hp capacity in smaller "package"




# REFERENCE BOOK OF THE PAPER AND PULP INDUSTRY

## used all year in the trade

*The Directory* contains production and personnel data on every pulp and paper mill in the U. S. Every copy of *Lockwood's Directory* is sold for $12, with the exception of one copy to advertisers for checking purposes; none to agencies.

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**Reserve space now for the 1960 edition, closing August 1.**

## LOCKWOOD'S DIRECTORY

*49 West 45th Street, New York 36, N. Y.*

## NEWS OF CONVERTERS

*(Continued from page 33)*

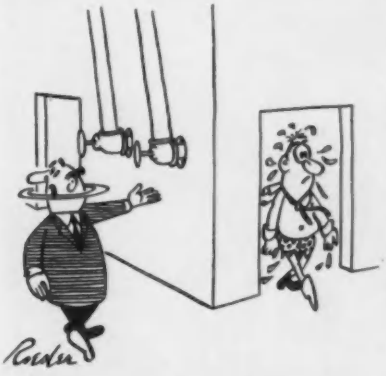
turing and sales operations at Detroit, Grand Rapids, and Flint, Mich., and Toledo. Mr. White, affiliated with the container industry since 1936, was vice president of Ottawa River Paper Co. when the firm was acquired by Mead in 1958. Ralph G. Young, manufacturing manager at the Toledo plant, has been named manufacturing manager for the midwest region.

From Cincinnati, Lawrence A. Sicking will manage the central region, which encompasses manufacturing plants and sales offices at Cincinnati, Durham, Louisville, and Chicago. Mr. Sicking, who joined Jackson Box Co. in 1924 in sales service, was vice president and secretary of the company when acquired by Mead in 1956. James F. Burnham, who is the Cincinnati district manager; will serve also as assistant regional manager under Mr. Sicking.

William H. Greenberg will be responsible for the sales and production of the northeast region headquartered at North Bergen, N. J. Plants and sales offices under his supervision are located at North Bergen, Jersey City, and Elizabeth, N. J.; Gardner, Mass.; Syracuse, and Baltimore. Mr. Greenberg was vice president of Gibralter Corrugated Paper Co., Inc., when Mead acquired that firm in 1959. Edward F. Monogue, production manager at the North Bergen plant, will be regional manufacturing manager under Mr. Greenberg.

William W. Wommack, administrative assistant to Mr. Cassady since 1958, has been named general administrative manager. Joseph G. Donohoo as general sales manager will be responsible for the overall selling and pricing programs for the entire division.

William F. Connor, promotion manager, has been named assistant general sales manager. Fred T. Renshaw, former national account sales manager in Chicago, is the new director of marketing services. Robert A. Sellery and John H. Hellweg will head the eastern and midwestern national account sales offices in New York and Chicago, respectively, and both will report directly to Mr. Donohoo.



**"In that room powerful jet streams debark the logs. Mr. Tugitfoot! Where are you?"**

## Business Forms Institute Names Johnsen President

Lester J. Johnsen has been elected president of the Business Forms Institute, trade association of the manifold business forms industry, by its board of directors at the Institute's annual meeting held at the Waldorf-Astoria hotel, February 17-19.

Mr. Johnsen, who is executive vice president of the Atlantic Register Co., Waltham, Mass., has long been active in the BFI, serving as first vice president during the past year.

The Pyrazol Fast range of Sandoz Directs is outstanding in fastness to light . . . outstanding in the other important properties as well . . . and is the prime choice in the coloring of nearly all grades of paper, from tissue to cover. For the booklet, complete with illustrations, that tells you all about Pyrazol Fast—write, wire, or 'phone: SANDOZ, INC. 61-63 Van Dam St., New York 13, New York. ALgonquin 5-1700. District Offices: Charlotte, Cincinnati, Fair Lawn, N. J., Hudson, Mass., Los Angeles, Philadelphia.

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THINKS AHEAD WITH PAPER

SANDOZ

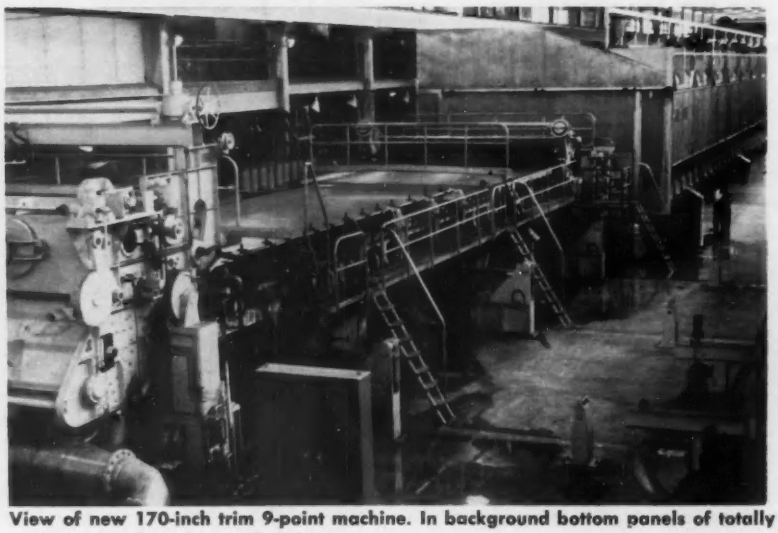
**Quality and production get a boost at this Big Island, Va., mill as . . .**

# Owens-Illinois Starts Up New Machine for Corrugating Medium

**Paul D. Van Derveer,**
Associate Editor,
Paper Trade Journal

Production of nine point corrugating medium at Owens-Illinois, Big Island, Va., plant has just been given a big boost by the startup of a 170-inch trim machine which will increase capacity by at least 30 per cent initially and ultimately by 90 per cent. The new machine replaces two older 102-inch machines which produced approximately 200 tons per day. Its initial capacity is 265 tons per day, and has potential in the future for 380 tons per day.

Installation of the new machine and construction of a building to house it was first announced in October of 1958 by C. G. McLaren, vice president and general manager of the Owens-Illinois Mill Division. Preliminary engineering had already begun in the spring of 1958, and after the announcement, construction was started in November of 1958. Design engineering was done by Helmick and Lutz; general contractor was Daniels Construction Co. Project manager and engineer for Owens-Illinois was H. N. Malmberg. The new paper machine is located adjacent to the old machine room and utilizes the same wood handling, pulping, and storage facilities formerly used for the old paper machines.



**View of new 170-inch trim 9-point machine. In background bottom panels of totally enclosing hood are in raised position.**

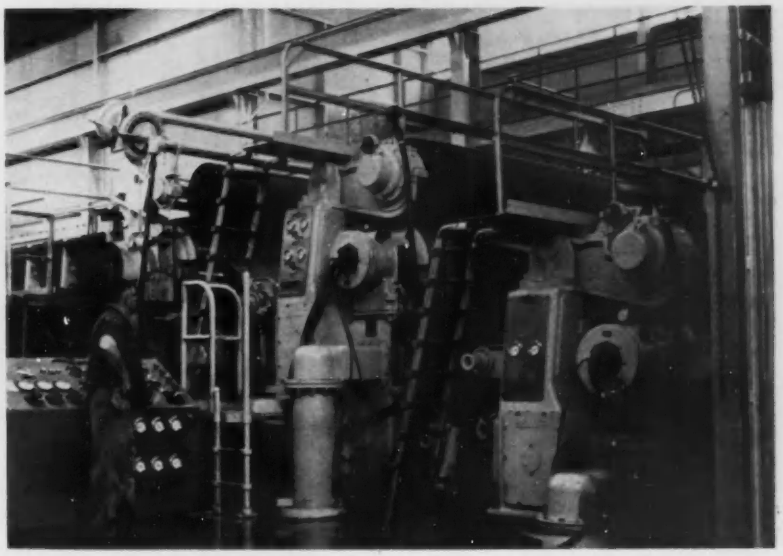
## Paper Machine

The new paper machine, built by Beloit, is designated No. 3, and is provided with a wire 186 inches wide by 139 feet 6 inches long and pressure headbox. Present top speed is about 1040 f.p.m. with the machine currently operating at about 900 f.p.m. Ultimate top speed is in the neighborhood of 1500 f.p.m., and this can be obtained by a simple gear change.

There are 31 table rolls, 9⅜ inches in diameter and covered with Fiberglass. The machine is equipped with 10 suction boxes and a suction couch, 42 inches diameter by 188 inches drilled face. The breast roll, the wire turning roll and the lumpbreaker roll are all 28 inches in diameter. The press section consists of two straight-through suction presses, each with a 30-inch diameter bottom roll and 28-inch diameter rubber covered top roll.

A unique feature of this machine is the arrangement for wire changing. The fourdrinier is removable, and the beams, instead of being hinged or lifted out of the way, are rolled into the aisle so that the wire can be set in place. This is the first fourdrinier so equipped by Beloit.

The dryers are 60 inches in diameter and are designed for 150 p.s.i. working pressure. There are three sections with 18 paper dryers, two return dryers and four Feeneys in the first section; 18 paper, two return, and two Feeneys in the second section; and 18 paper and two return dryers in the third section. The dryers are equipped with a standard Beloit three stage dryer drainage system. The entire dryer part is completely enclosed by a modern aluminum panel hood by J. O. Ross. The moisture control system is by Stamm.



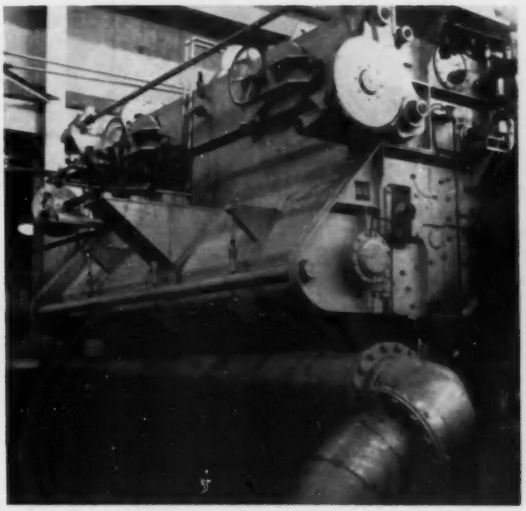
**Operator observes press section operation. There are two straight through suction presses.**

The reel is a heavy duty pneumatic type with 36-inch diameter drum handling a reel up to 88 inches maximum diameter. The Beloit Model M shear cut winder is capable of operating at speeds up to 4500 f.p.m. and winding a 60-inch maximum diameter roll. It has air loaded slitters and automatic tension control. It is driven by a 300-h.p. motor through a Dynamatic clutch with variable speed V-belt drive to the front drum.

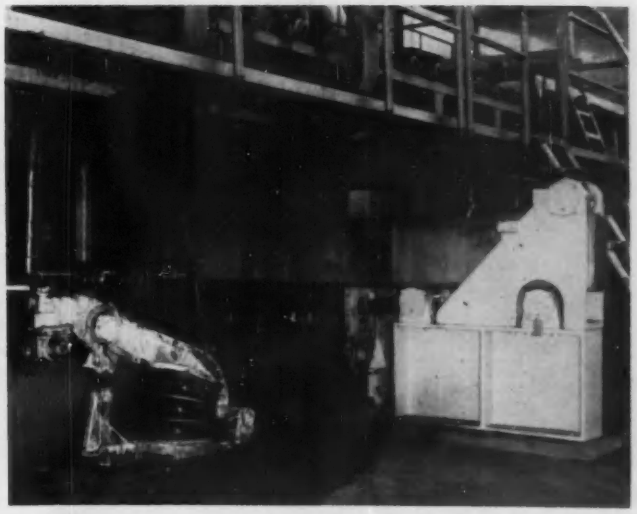
A pulper is located in the basement beneath the winder with a conveyor carrying broke to it. The conveyor is full paper machine width and leads from below the last dryer to the pulper which is a Black-Clawson Hydrabreaker. Installed because of limited headroom, this Hydrabreaker is one of the first to go into operation. It has a horizontal shaft with 42-inch diameter rotors and is driven by a 100-h.p. motor through Falk gear reducers. The pulper is equipped with automatic consistency regulation and level control instruments.

## New Type Drive

The lineshaft on No. 3 is driven through a Dynamatic clutch and a



**Pressure headbox is a multiple pipe, double impingement type with two stainless steel rectifier rolls.**



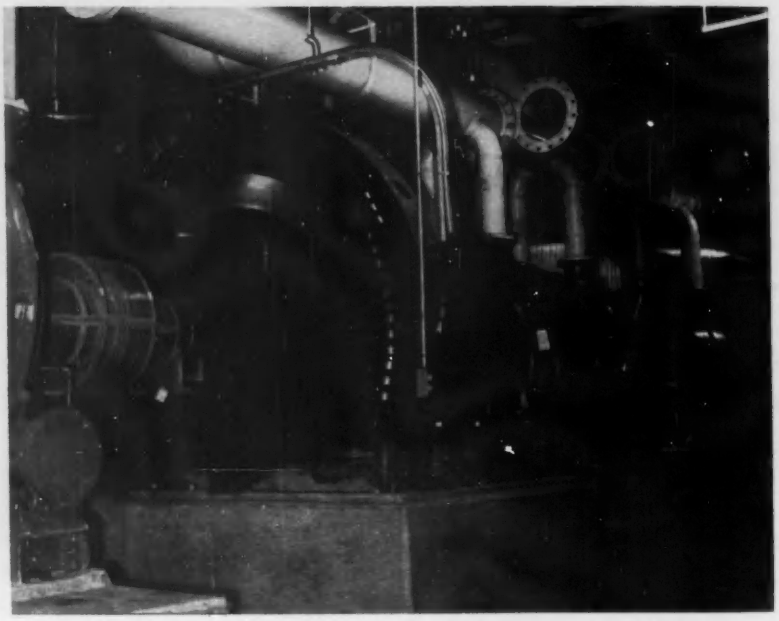
**Entire wet end is removable. Beams, as shown above, also roll out into aisle. At left is wire tension dvice.**

gear reducer by two Allis-Chalmers 500-h.p. motors. This is one of the first paper machine installations of the Dynamatic coupling units which are made by the Dynamatic Division of the Eaton Mfg. Co. The machine has four of these units; one on the couch, another on the winder and two on the main drive. All four units are the same size so that only one spare is needed.

There are helper drives on the couch, first outside wire roll, and lumpbreaker roll. They are coupled electrically with the line shaft to synchronize with the speed of the machine.

The machine has a Beloit roll filter lubrication system consisting of two units, one handling gear cases, the other smaller unit handling drive and dryer bearings. Vacuum is provided by four Nash vacuum pumps driven by a single motor.

The totally enclosed air handling system, roof air system and calender cooling were provided by J. O. Ross. A fourdrinier exhaust system to eliminate vapor and steam around the wet end and a cooling system for the electrical control room were also by J. O. Ross.



**Shown here are two of the four Nash vacuum pumps and the 1000 h.p. motor which drives them through a line shaft.**

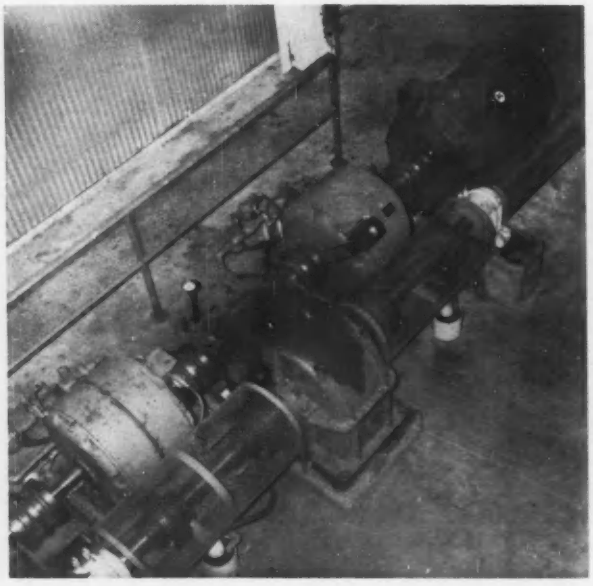
## Stock Preparation

Stock for the new machine consists of hardwood NSSC and kraft fiber secondary furnish. The hardwood pulp is pumped from the pulp mill chest through a consistency regulator to six primary Jones Majestic jordans which can be used in series or as two sets of three in parallel. From this point the pulp goes to a storage chest and is pumped to three secondary jordans in series (two are Jones Imperials and the other a Shartle Miami No. 6) and then with the aid of a booster pump to No. 3 machine chest.

Kraft fiber secondary furnish is processed by a Hydrapulper, two Jonsson screens, a decker and jordan before going to a chest for storage. Most of the stock preparation equipment as well as wood handling, pulping and recovery equipment was used to supply the older machines and is not new.

The stock is next pumped to a new Bauer 440 pump through refiner, used as a tickler, and then to a level controlled De Zurik consistency regulating stuff box from which it drops to a 12,000-g.p.m. fan pump. Rich white water from the wire pit is mixed in here before the stock goes to the primary, secondary and tertiary Centricleaner system. All are Bauer model "606" Centricleaners. Accepted stock from the primaries goes directly to the headbox through a tapered stock inlet.

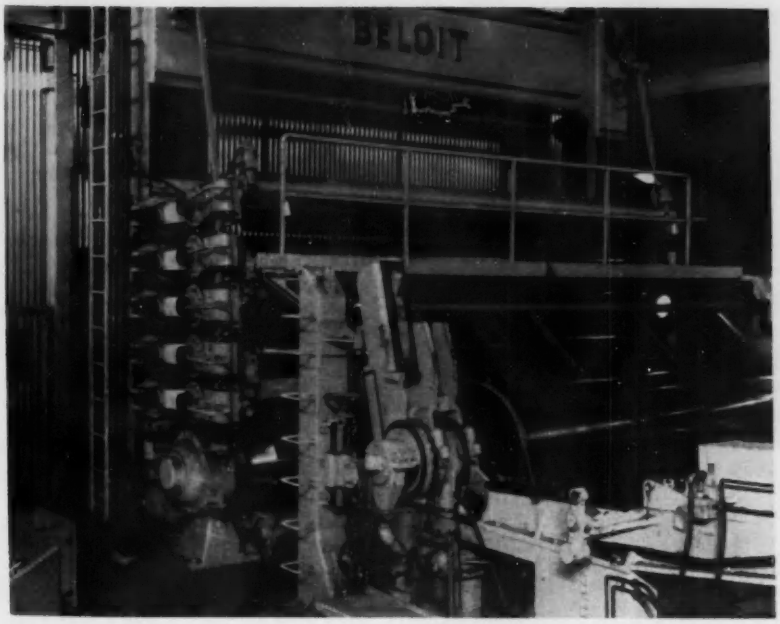
Stock chests are tile lined as are the wire pit and couch pit which also have automatic level control. There is De Zurik consistency regulation on the Hydrabreaker, on broke from the broke chest and on the kraft secondary furnish. Also in the stock preparation area is a new broke decker 48-inches in diameter by 110-inches, used primarily to handle couch pit broke, supplied by Improved Machinery Co.



**Main lineshaft is driven by two 500 h.p. motors through Dynamatic clutches and a gear reducer. The system provides extremely close speed control.**

## Hardwood Pulping Process

Wood for Owens-Illinois' Big Island mill is obtained locally and consists entirely of hardwood species, primarily oak, which are brought to the mill woodyard in 7½ foot lengths. The logs are carried, via an 800-foot flume and jackladder, to the woodroom where a D. J. Murray 10-knife, 112-inch chipper reduces them to chips of the proper size. The chips are screened and then conveyed to chip bins of 160-cord capacity by a




**Six-roll calender stack has 30 inch diameter king roll. Reel has 36 inch diameter drum.**

belt conveyor system spanning the entire length of the mill.

Chips are fed as required to three Pandia Chemi-pulpers, each consisting of six tubes. The chips are cooked continuously by the NSSC process in the Chemi-pulpers. The cooked chips drop into a preheater screw conveyor which moves the chips, still under pressure, into the defibrator and then into a small blow tank from which they are fed into a stock chest. Consistency is controlled at this point to five per cent by a De Zurik regulator.

Three 42-inch Sutherland refiners, operated in series, further process the stock which then is washed on three Impco countercurrent washers. Following the third stage of washing, stock goes to a Bird consistency regulator and to the pulp mill storage chest at five per cent consistency. This is said to be the first installation in the U.S. of this type of digester system which was originally installed in 1944.

## NSSC Recovery

Another unusual feature of the Big Island mill is the recovery plant which is used to recover chemicals from the NSSC pulping process. No other liquors are involved. The Institute of Paper Chemistry process is used.

Black liquor from the first stage washer in the pulp mill is pumped to the recovery plant at nine per cent solids where it goes to four multiple effect evaporators. Solids are increased to 40 per cent and the liquor is then sprayed into a venturi scrubber where it is further evaporated to 60 per cent solids and carried into a cyclone separator by the hot gases. The liquor then goes into the Babcock and Wilcox furnace where the organics burn off leaving a smelt of sodium carbonate and sodium sulfide which goes to the dissolving tank forming green liquor. This is further clarified and sulphited with $SO_2$, forming the finished liquor which is pumped to the pulp mill to be used in the cooking process.

## Personnel

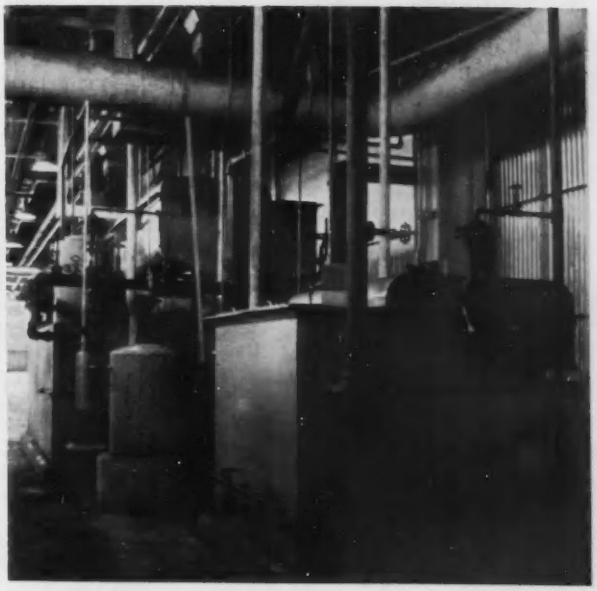
The mill at Big Island employs about 225 people, many of whom have long service. Plant manager here is J. C. Theiler and general superintendent is Cecil Curry. R. J. Gilmer is pulp mill superintendent and Clarence Heidemann is paper mill superintendent.

Other key personnel includes: George Gribble, personnel director; J. A. Edson, woodlands manager; R. A. Graves, office manager; C. D. Parker, power engineer; A. M. Saenz, plant engineer; J. E. Winderweedle, maintenance engineer; H. L. Downey, master mechanic; and B. J. Beau, chief chemist.

Vice president in charge of production for the Owens-Illinois Mill Division is K. M. Cherry. General manager of the Mill and Woodlands Division and vice president of Owens-Illinois is C. G. McLaren. President of the Mill and Woodlands Division and executive vice president of Owens-Illinois is H. C. Laughlin.

## Papermaking Has 70 Year History at Big Island

Located about 18 miles from Lynchburg, Va., the paper mill at Big Island is said to be one of the oldest in the South. Pulp was produced here on the James River in the early 1880's and a section of the present pulp mill walls was originally a part of the canal locks of the James River-Kanawha Canal. This canal was intended by George Washington



**Roll filter lubrication system consists of two units. The larger one, in background, is for gear cases; the smaller one handles drive and dryer bearings.**

to link the East and West.

The first paper mill here was erected in 1889 and at that time, many local residents left farms and other jobs to "work at the paper mill" which was known as the Lynchburg Pulp and Paper Co. Installation of the first paper machine was completed in 1891 and the first sheet of paper was produced on March 27, 1891. During the following years, the principal product was wrapping paper and Globe Ticket. In 1898 a charter was granted to the Bedford Pulp and Paper Co. and a few years later, the Marcus Brothers became sole proprietors.

In 1904 the second paper machine was installed and a pulp mill was built at Coleman Falls, five miles southeast of Big Island and also on the James River, to furnish pulp for the increased production.

On March 1, 1914, the building was completely destroyed by fire and after rebuilding, two 102-inch Pusey and Jones fourdriniers were installed at that time and were still being used until the startup of the new machine.

When production was resumed, wrapping paper, transfer paper, manila envelope paper, and gun shell tubing were among the items produced. During World War I, newsprint was manufactured for a short time. In 1925 kraft paper was produced using purchased pulp.

Nine point paperboard for boxes was first produced after the addition of a new power plant and pulp mill in 1929. This was made from groundwood pulp and purchased sulphite pulp. Since that installation, nine point corrugating medium has been the mill's chief product. Prior to this, the mill produced groundwood pulp from pine, and it is believed to be one of the first operations in this country where pulp of this type was successfully made from southern pine.

Immediately after National Container Corp. purchased the property in 1944 the pulp mill was modernized and a continuous pulp making process utilizing the Chemipulper and Asplund defibrator was installed. This pioneered the development of semichemical corrugating medium production from a continuous process using southern pine and hardwood. However, at present only hardwood is used.

In 1956 a recovery plant was added to the Big Island mill for neutral sulphite semi-chemical liquors.

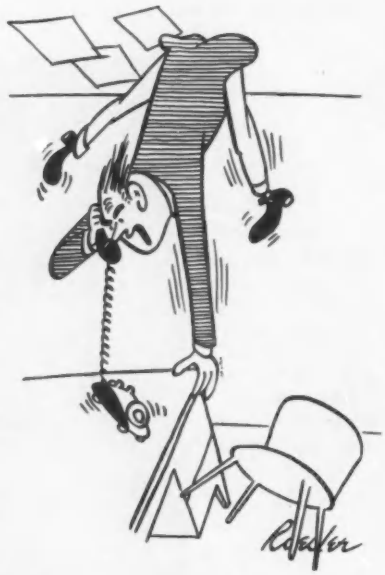
The mill became part of the Owens-Illinois Glass Co. in 1956 when National Container was merged into Owens-Illinois.

# Madison Lab to Observe Golden Anniversary June 2-4

The accomplishments of 50 years in pulp and paper research will be one of the highlights of the Golden Anniversary celebration being planned by the U.S. Forest Products Laboratory at Madison, Wis., June 2-4 this year.

The pioneer laboratory came into being in 1910 when the Forest Service of the U.S. Department of Agriculture entered into a cooperative agreement with the University of Wisconsin. That agreement provided that the University furnish a building and the Forest Service staff and equip it. When the new venture was dedicated June 4, 1910, a corps of 45 Forest Service scientists gathered in a new building that was to serve for the next 22 years.

One of the broad functional divisions in the original Laboratory organization was a section of Pulp and Paper. It fitted smoothly into a then novel concept of research that has demonstrated its practicality throughout the years. This concept was the basic idea of a forest products laboratory—until then unknown in the world—combining the traditional sciences to concentrate on given areas of research. Thus, in pulp and paper, chemists, physicists, chemical engineers, botanists, pathologists, and foresters have collaborated closely from the start. Besides Pulp and Paper, six other technical divisions are similarly organized, and all cooperate closely.



"You up there! Watch the suction on those paper machine rolls."

Launched in an era when few men regarded science as little more than a curiosity of the college campus, the Forest Products Laboratory has been one of the most potent agencies in guiding the whole complex of wood-using industries to more effective use of its raw material. No segment of this industrial complex has been left untouched by the inquisitive minds that have probed, dissected, measured, weighed, and otherwise studied wood from tree through test tube to the ultimate user.

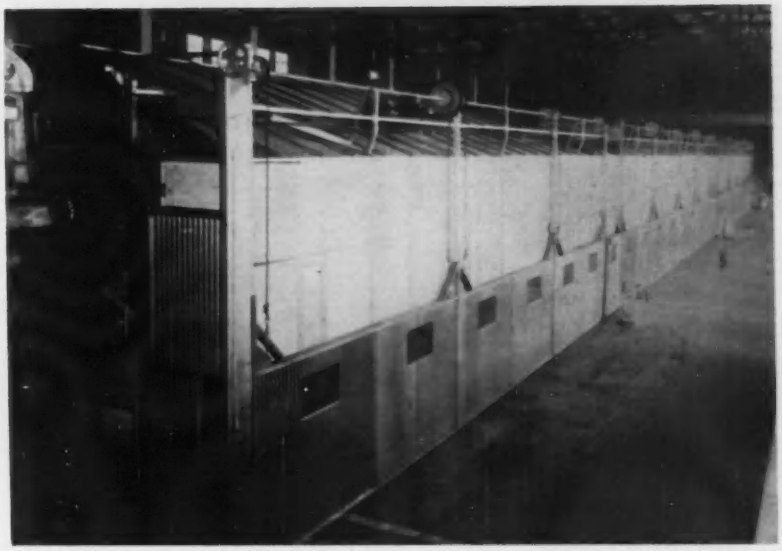
To mark the first half century of its work, the Laboratory is planning a series of events for the three days June 2, 3, and 4. Since its official birthday falls on Saturday this year, its staff will hold Open House for the general public that day.

The program of events will begin with a banquet Thursday evening. Friday morning will be devoted to a general meeting of staff and visiting guests at which key industry figures will discuss the significance of forest products research. Among speakers will be F. K. Weyerhaeuser, chairman of the board of the Weyerhaeuser Co.; H. E. Whitaker, board chairman of the Mead Corp., Dayton, Ohio, and president of the American Paper and Pulp Ass'n.; W. E. Difford, managing director, Douglas Fir Plywood Ass'n.; and Samuel W. Lenher, vice president and adviser for research of E. I. duPont de Nemours and Co.

At a noon luncheon Friday, Stanton W. Mead, president of the Consolidated Water Power and Paper Co. of Wisconsin Rapids, will be one of the speakers. Friday afternoon will be devoted to tours and special events at the Laboratory for visiting guests. Highlights among Laboratory exhibits on display will be demonstrations of its semichemical and cold soda processes, which have greatly broadened the utility of hardwood species for pulp and paper.

# Many Benefits Gained from Conversion Of Open Hood to Closed

When West Virginia Pulp and Paper Co. recently added "on machine" coating to its Number 5 machine at Covington, Va., it also converted the open hood on this machine to a totally enclosed hood. The machine has 56 dryers, 216 inches across the face and 60 inches in diameter. It produces board for such uses as cigarette cartons, drinking cups, and foodboard. Conversion from open to closed hood was by the J. O. Ross Engineering Division of the Midland-Ross Corp.



**Hood of West Virginia Pulp and Paper's Number 5 machine at Covington, Va. which was converted from open to closed type by J. O. Ross Engineering.**

### Results Obtained

Attention to the perfection of coating operations has to date precluded a complete evaluation of results obtained from the hood conversion. However, preliminary indications are that increased operating speeds will result in an approximate increase in production of ten per cent and that steam consumption will be reduced about five per cent. Operating speeds range from about 300 to 600 f.p.m. with 450 f.p.m. being perhaps the most representative figure. The machine has a capacity of 250 tons of board per 24 hours.

Air volumes required to carry off evaporated moisture have been cut some 40 per cent, and two fans formerly used to exhaust air from the hood, are no longer required. In addition, the four remaining fans are operated at slower speeds.

Wet-end room temperatures have been cut about 15 per cent. Temperatures which formerly ran up to 100°F. on a hot day now seldom exceed 90°F., and relative humidity now does not often go above 70 per cent, whereas previously, 80 per cent was not uncommon. A further advantage is a more uniform moisture profile across the sheet.

### Existing Hood Retained

In installing the Ross totally enclosed hood, the existing open hood was retained and was lengthened 46 feet to cover additional dryers installed at the same time as the coaters. The open hood comprises the traditonal peaked roof, hipped at each end, and 7-foot high side and end curtains which, in this case, extend down to within approximately 6½ feet of the floor. An extra thickness of insulation was added to the ceiling, since higher air temperatures were to be used. Whereas formerly the greater percentage of air circulated through the machine was room air, this supply was to be curtailed, and replaced largely by outdoor air heated to a predetermined temperature, and ducted into the machine enclosure. Proper ceiling insulation is, of course, important in preventing the formation of condensation on the underside of the hood roof, and its consequent dripping onto the machine and sheet.

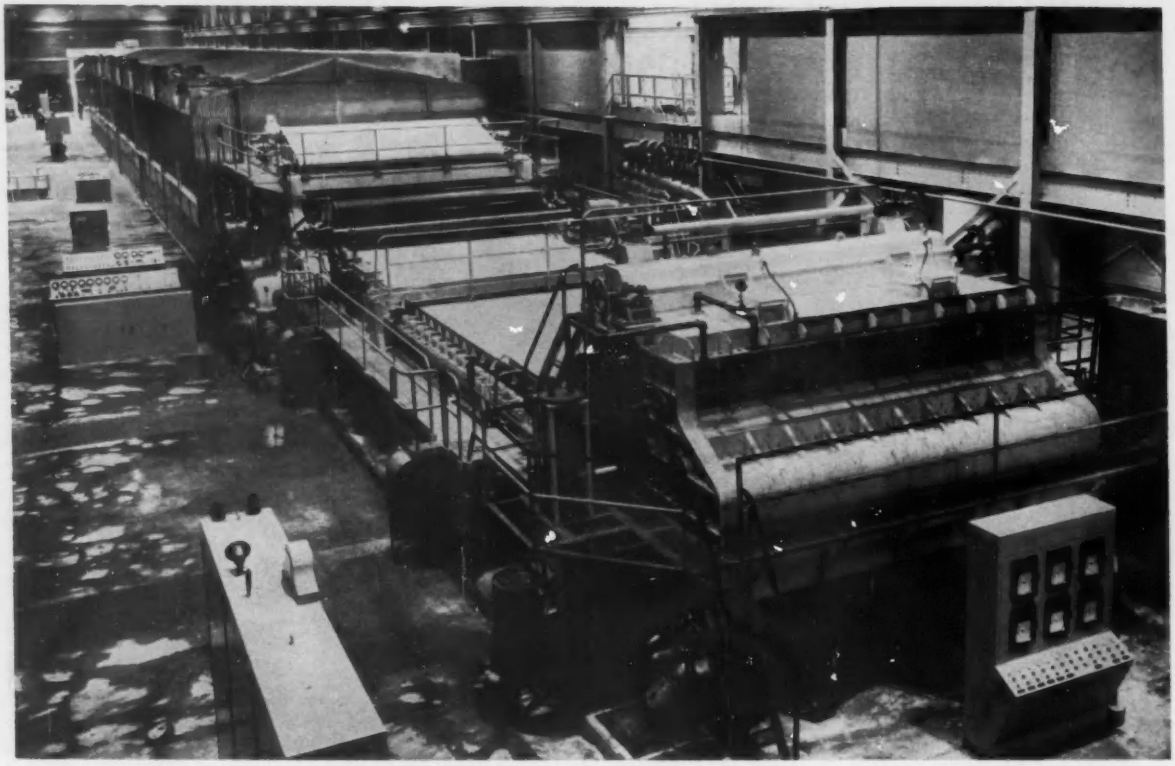
### Side and End Panels Installed

In converting the open hood to a closed one, side and end panels were installed to enclose the space between the existing hood and the floor. These panels have a core of insulating material encased between aluminum sheets. Panels on the operating side rise vertically along aluminum guide channels to expose the machine. These panels may be raised in sections or as a group. They all rise automatically in the case of a break. Motors which raise and lower the panels are mounted on the roof, and drive sprockets and cable pulleys are secured to sections of shafting which run the length of the machine, above the eave. Aluminum construction of these panels is advantageous from the standpoints of weight, corrosion resistance and appearance. The panels are equipped with observation windows at frequent intervals.

Panels on the drive side are hung from aluminum tracks and slide sideways to open any portion of the hood for access to the dryers. Lifting panels are provided at the ends of the machine for threading, and doors are provided for personnel entry.

### Basement Space Enclosed

The basement space beneath the machine has also been enclosed, to permit full control of air circulation. One side of the enclosure is of cement block, while the other is of .040-inch aluminum sheet, secured to angle frames. Sliding doors have been provided for removal of broke. One of the fans formerly used to supply room air now delivers heated air into the basement enclosure for circulation upward through the machine.



Wide angle overall shot of machine from wet end.

# Canada's Newest Fine Paper Machine Starts Up in Cornwall

Latest addition to the continually expanding fine paper and board mill of Howard Smith Paper Mills, Ltd., at Cornwall, Ont., is a new paper machine. The new machine which began operation in late January is designed for production of such grades as register, mimeo, offset and light weight boards. It started up approximately 45 weeks after ground was first broken for construction of the machine room on the new site on the western boundary of the property.

### Machine Room Design

The new machine room was erected to the north of and adjoining the existing finishing room. The building which is designed for later installation of a second machine, measures approximately 450 by 114 feet.

The building houses the main machine room and has a span of 96 feet with an 18-foot bay running the entire length of the building. This provides a traffic aisle at the back of the machine and also space for locker rooms, machine accessories which include a save-all, ventilation and stock metering equipment on the mezzanine level, and machine economisers at an upper level.

The building, which is windowless, was enclosed on all sides with eight-inch Siporex, laid in slabs spanning 18 feet, column to column. The individual slabs are 18 feet high. The Siporex was laid on dividing strips of foam plastic. Later the entire inside surface of the walls and roof was prime coated with a mixture of coal tar and epoxy and two additional coats of grey epoxy as finish.

The roof structure consists of a 7-inch structural slab of Siporex overlaid with 18-inch squares of 3-inch thick blocks of Siporex. These are bevelled on their bottom edges to allow breathing passages which carry off any moisture penetrating the paint membrane on the inside of the building. Plastic gooseneck vents located at 50-foot intervals in the roof are provided for this purpose. Hollow construction of the parapets on all sides of the roof provides a chimney effect to draw air through these ventilating passages. The roof membrane is a bonded bituminous and gravel roof.

### The Paper Machine

The new paper machine was built by Dominion Engineering Co., Ltd., and installed by mill personnel.

The machine is equipped with a Dominion pressure head-box and a fully removable fourdrinier with a 95-foot wire. Wire width is 184

inches and trim will be approximately 165 inches.

The press section includes two suction presses, the second of which is a reversing press, and one smoothing press. The dryer section consists of 52 paper dryers and eight felt dryers all five-feet diameter, in three main sections separated by a breaker stack and a horizontal size press. The dryer section is completely enclosed in a hood provided by Ross Engineering of Canada.

The machine is equipped with two calender stacks, a Dominion constant pressure reel and Dominion winder.

First sole plates were laid on September 14, 1959, and first equipment deliveries were received on September 29, 1959. The start-up was January 18, 1960.

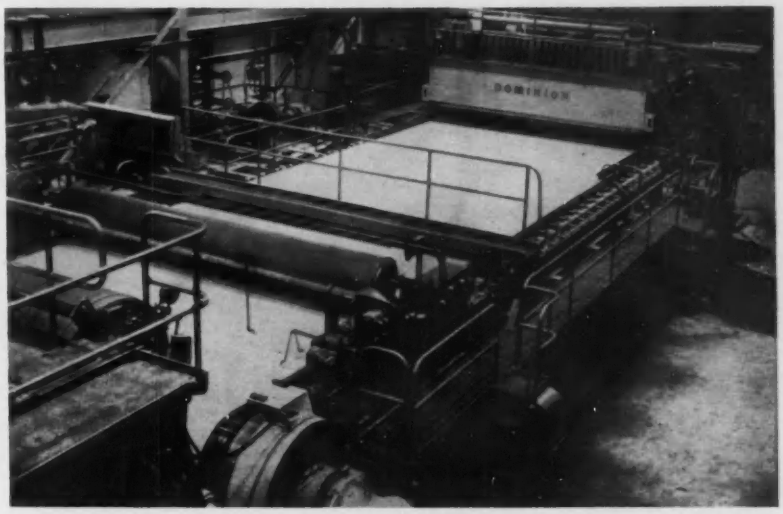
The machine room accessories include a bridge crane which spans the main arch of the building 96 feet 8 inches center to center of crane rails.

The dry end of the machine is equipped with a semi-gantry Morris crane of 11-ton capacity for the handling of machine reels with remote control from either the reel or winder console.

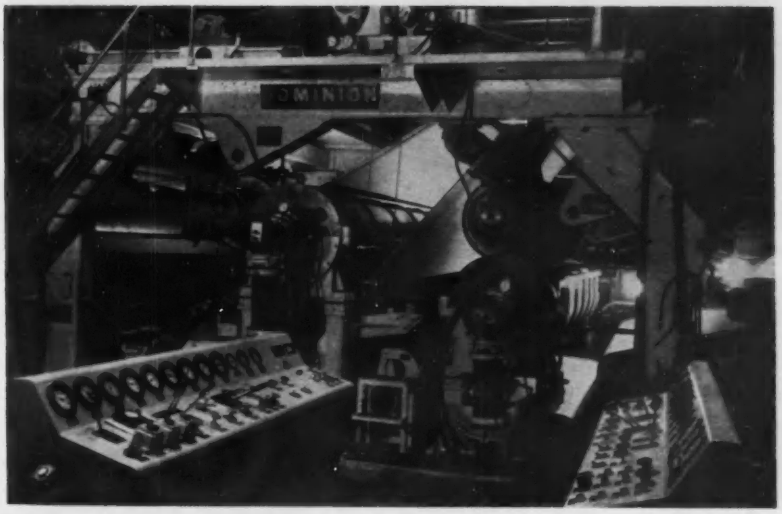
A Churchill roll grinder was installed in the basement of the machine room. This grinder is equipped with a cambering mechanism and can handle rolls up to 312-inches long and up to 40-inches in diameter.

## Machine Drive

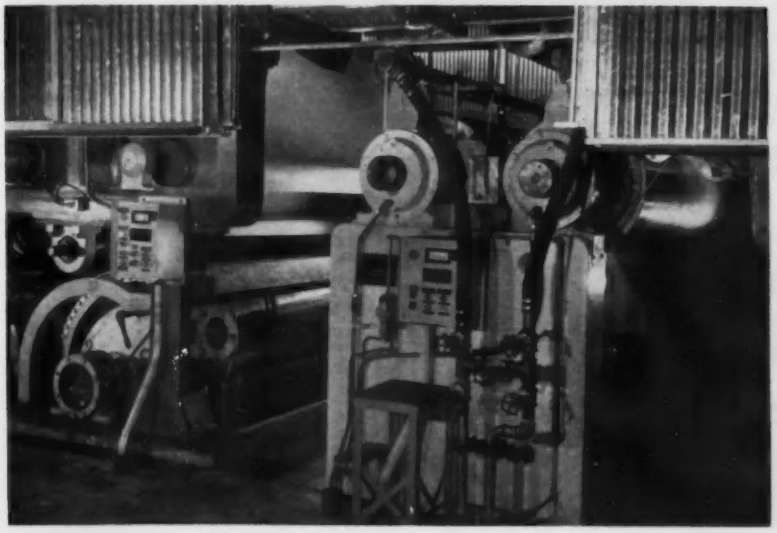
The paper machine is driven by a mechanical drive consisting of a 1500 h.p. motor at 6900 volts which drives through an Eddy Current coupling, supplied by George Rumble Co., to a Dominion gear-box which provides reduction to the main line shaft located in the machine room basement.



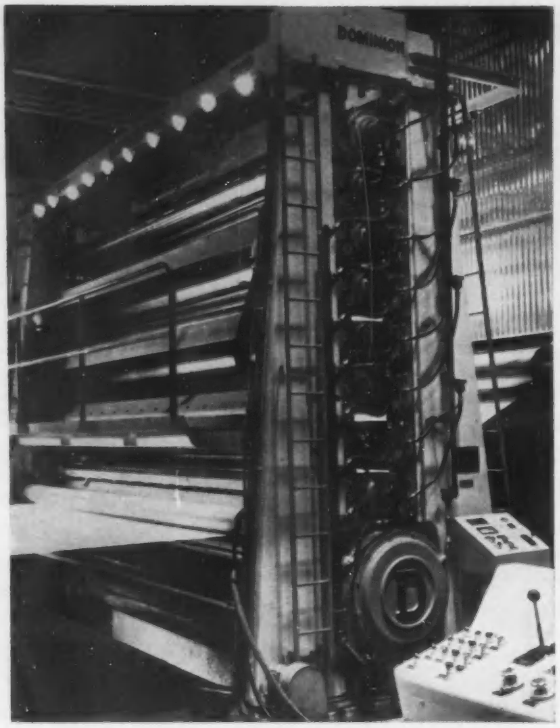
View of fourdrinier looking northwest showing refiner piping beyond the headbox and the typical construction of the economizer bay.



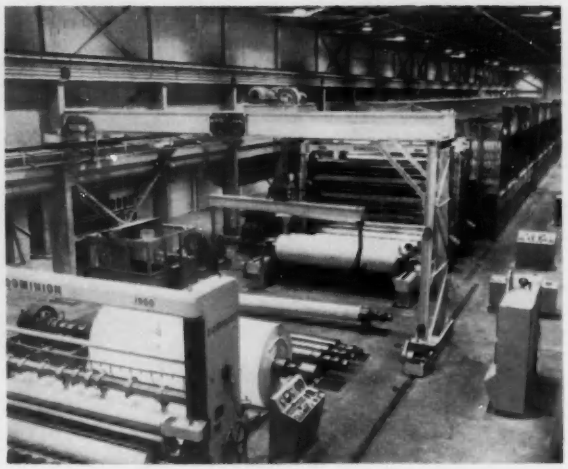
Press section—1st suction press, 2nd reversing press and ring marking, third plain press. Note hydraulic control panels.



View of horizontal size press showing in addition the typical dryer framing arrangement.

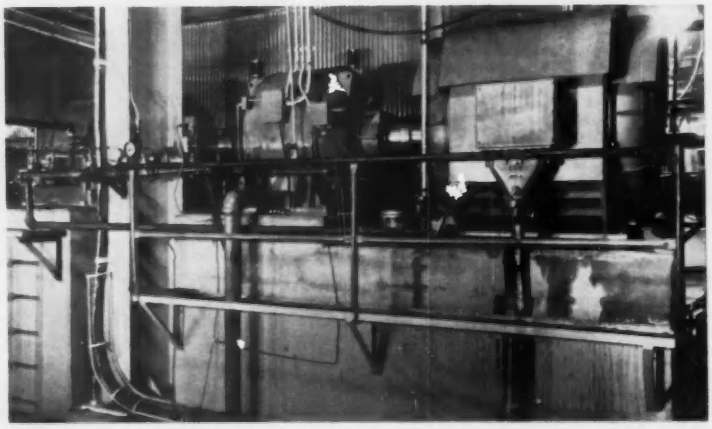


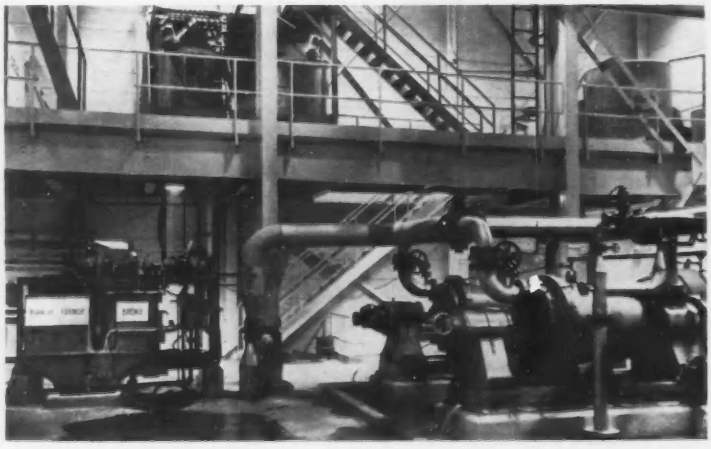
◀ First calender stack, showing the main console for two stacks, the sub console for the first stack and the air header doctor combined.



▲ Overall shot from dry end.

Main drive motor with Dynamatic control ▶ located in centre of lineshaft in the machine room basement. Enclosure of dryer section in background.





◀ View of the northwest corner of the building showing the Majestic jordans, Trimbey meters, color mixing and storage system and alum storage above.

The main line shaft serves 13 sections of the machine through cone pulleys and nylon core belting supplied by Monarch Belting.

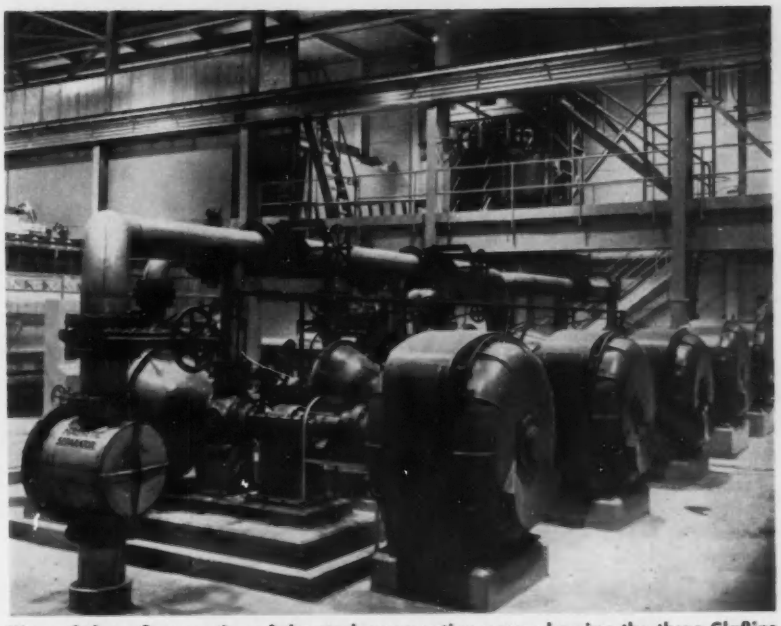
The in-drives were supplied by Dominion Engineering and include gear boxes and Fawick air clutches, all of which are completely controlled from the front of the machine.

The control equipment included Dynapar draw speed indicators and controls.

The couch suction boxes are equipped with two Roots-Connerville two-stage vacuum pumps and one Nash K-6 pump was provided for the flat boxes.

The suction presses are served with three Nash H-10 vacuum pumps provided by Nash Engineering of Canada, Ltd.

A Sveen Pedersen save-all of 2,000-gallon capacity, is located on the mezzanine behind the machine.



**View of the refiner section of the stock preparation area, showing the three Claflins in foreground followed by the two jordans.**

## Stock Preparation

As a result of the new location for No. 6 machine, the wet end of the machine is approximately 1500 feet from existing stock preparation facilities. To provide space for new equipment, it was necessary to modify substantially the facilities previously servicing the fourdrinier machines. An entirely new continuous stock metering system was installed on No. 1 machine, replacing the batch system previously in use, and providing both equipment and floor space for the extension to stock slushing and mixing facilities.

The stock preparation system for the paper machine includes three No. 3 Claflin refiners and two Majestic jordans.

The Centricleaner system consists of 19 No. 623 Bauer cleaners in the primary system and two No. 623-4 secondary cleaners.

The fan pulp pump operates at a low head, with variable speed control through a dynamatic drive. The stock passes through two Centriscreens supplied by Ingersoll-Rand. Rejects are re-screened over a Jonsson knotter.

No. 6 machine, as well as No. 1 machine, is now equipped with a complete Trimbey metering system providing for continuous control and metering of slush sulphite, soda, kraft and broke plus the continuous metering of size, alum and color. In addition to Trimbey meters, there are Fischer & Porter stock regulators and Foxboro flow meters.

### MACHINE FEATURES

| | |
|---|---|
| Weight range | 20 to 140 lbs. |
| Speed range | 250 to 1,500 f.p.m. |
| Wire width | 184 inches |
| Number of dryers | 60 |

Completely enclosed hood

Two suction presses and one smoothing press; a breaker stack; horizontal size press; and two calender stacks.

Constant pressure reel

Length from headbox to winder ..... 352 feet

1,500 h.p. electric motor driving through an eddy current coupling to a basement lineshaft. Power is carried from the lineshaft to machine sections by cone pulleys, plastic core belts and gear reducers.

Ultimate capacity ..... 170 tons per day

Pressure type headbox

Building measures 450 feet by 114 feet

Space available for an additional machine

### ESTIMATED PRODUCTION

| Grade | Weight | Speed | Tons/21 Hours |
|---|---|---|---|
| Register | 20 | 1100 | 71 |
| Register | 32 | 1500 | 156 |
| Register | 40 | 1200 | 155 |
| Mimeo | 35 | 1370 | 156 |
| Offset | 38 | 1200 | 147 |
| Offset | 46 | 1050 | 155 |
| Offset | 120 | 300 | 116 |
| Board | .006" | 345 | 116 |
| Board | .010" | 345 | 116 |

*NOTE:* The above are based on a nominal trim of 160 inches

## Finishing

To provide finishing area for increased production, the finishing room was extended by an addition approximately 343 feet by 128 feet immediately to the south and adjoining the existing finishing room. This extension which included a lower level with columns at 16-foot centers which will serve as stock room, provides two additional 60-foot bays clear of all columns on the operating floor which corresponds in elevation with the new machine room.

New finishing equipment includes two Masson-Scott cutters.

# Storing Pulpwood Underwater in Winter at a Finnish Mill

**In this article specially prepared for Paper Trade Journal, the author relates how Kaukopää mills keep pulpwood storage areas in Lake Saimaa free of ice in winter.**

**Pentii Salenterä,**
Assistant Editor,
Finnish Paper and Timber,
Helsinki, Finland

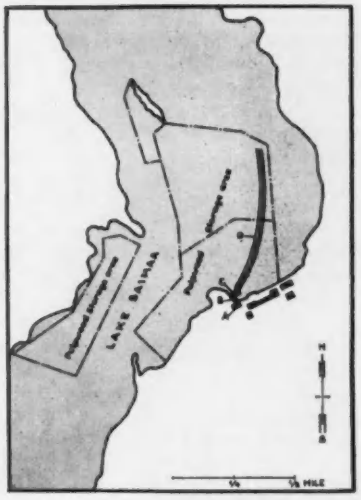



**Figure 1: Map of Kaukopää mills and portion of Lake Saimaa showing relative location of air compressor (A), air pipe (B), header (C), and hoses (D) leading into wood storage areas.**

The Kaukopää Mills are situated on the shores of Lake Saimaa not far from the southeastern border of Finland. The daily wood requirement at Kaukopää amounts to about 2,800 piled cords. The main part of this wood is floated to the mill on the Lake Saimaa system. As a consequence of long floating distances, new logs do not arrive at the mill until midsummer and driving has to be completed by October due to the risk of the lake freezing over. According to this, the mill has to store an 8-months wood supply in the immediate neighborhood. As the wood consumption already is about 50,000 cords per month, and it is still increasing, it means that the mill must have capacity to store about 330,000 cords. Kaukopää found that to store this large amount of wood on the ground presented considerable difficulty, in addition to incurring a great risk of fire. Consequently, the mill had earlier begun trials in storing pulpwood in the water. As they proved successful, the company has since gone over entirely to this practice.

## Largest in Europe

The Kaukokää mills are the largest of their kind in Europe and form Enso-Gutzeit Company's most important production unit. Built in 1935 they had an original production capacity of 88,000 short tons of unbleached kraft pulp. At this moment annual capacity is about 330,000 short tons, of which about 220,000 tons are converted into bleached and unbleached board. When the expansion presently under way is completed this year, annual capacity will amount to 500,000 short tons of kraft pulp. Four fourdrinier machines will have a joint annual production capacity of 400,000 tons of

bleached kraft paper and board. The present bleach plant has a capacity of 330 short tons a day.

The principle behind the idea permitting the storage of wood in the lake during the winter is to utilize the heat content of the water itself to melt the ice. In the autumn, when the surface of the lake freezes, the water of about 38°F. remains at the bottom. If it is in some way possible to get this warmer water from the bottom to the surface, it will melt the ice. It is, of course, presumed that the lake is deep enough.

At Kaukopää, air bubbles are used for this purpose. In addition, electrically-driven propellers are used to push in a lateral direction the warmer water taken up to the surface.

The equipment the mill uses to keep the storage area open is as follows (refer to Figure 1): In the wood room there is an air compressor (A) from which the air is brought through a steel pipe (B) to the shore and then to the bottom of the lake. There is a distributing pipe (C), to which the necessary amount of hoses (D) are joined. The hoses may be made of rubber or polyethylene plastic. Each hose has small holes at set distances permitting the air to escape. The hoses, the length of which varies from 100 to 1000 yards, are transported to their definite locations by means of a diesel tugboat and a ferry, on which the reel of hose is carried (Figure 2). To be sure that the air-filled hose stays on the bottom of the lake, a used wire rope is attached to it.

**Figure 2: View of diesel tug and ferry, showing how air hoses are laid. Attached to the hose is wire cable to prevent the air-filled lines from rising to the lake's surface.**

**Figure 3: Electrically driven propellers are used to assist in bringing warmer water to the lake's surface, as demonstrated in this photo.**

## Propellers Used

To loosen the day's demand of wood from the raft, the propellers, driven by electric water current generators, are used (Figure 3). In 24 hours they are able to melt so much of ice around the bunches of wood that the tugboat is capable of towing the necessary bundles to the immediate neighborhood of the cranes, which lift the wood into the chipper room.

The wood storage area is about 250 acres where it is possible to store about 360,000 cords (Figure 4). The wood is floated and stored in bundles of about 5.5 cords each.

The whole wood storage area mentioned above can be used during the entire winter by means of the melting equipment described. The arrangement has been in operation since the winter 1953-1954, originally along with the ground storage of wood, later as the sole storing practice. Kaukopää reports that it has proved very successful and no difficulties to mention have occurred.

**Figure 4: General view of the pulpwood booms. Wood is stored in bundles holding about 5.5 cords each.**

MAINTENANCE SERIES
NUMBER 11

# Black Liquor Evaporators Require Optimum Tube Cleanliness

**Being custom-designed equipment, a maintenance schedule, therefore, should be based on experience with that particular installation. This would consider tube cleaning and replacement, body inspection, condensers, and air ejectors.**

**Jack N. Brown,**
Manager, Pulp & Paper Dept.

and

**George Kleinman,**
Chemical Engineer

Swenson Evaporator Co.,
Harvey, Ill.

The purpose of an industrial maintenance program is, by definition, to keep equipment operating at optimum capacity and efficiency. An effective maintenance program will attempt to anticipate the need for action so that remedial measures can be taken before a costly unscheduled shutdown is necessary. A kraft mill black liquor evaporator is a specialized type of heat transfer equipment and as such its capacity is dependent on the condition of all of its components including the heat transfer surfaces. The maintenance program, therefore, should be concerned with optimum tube cleanliness as well as the prevention of physical deterioration of the evaporator and its auxiliaries.

A black liquor evaporator is custom-designed and thus is not a standard piece of process equipment. While similar in fashion, no two evaporators are necessarily of the same design or materials of construction. Differences are dictated by operating conditions such as steam economy, steam pressure, liquor discharge concentration and feed liquor properties which vary from mill to mill. This suggests the importance of basing the maintenance program on the past experience of each mill. A basic tool for initiating an effective preventive program is an adequate record of past maintenance experience. Important information such as tube life, tube replacement cost and cleaning frequency should be available in the maintenance records.

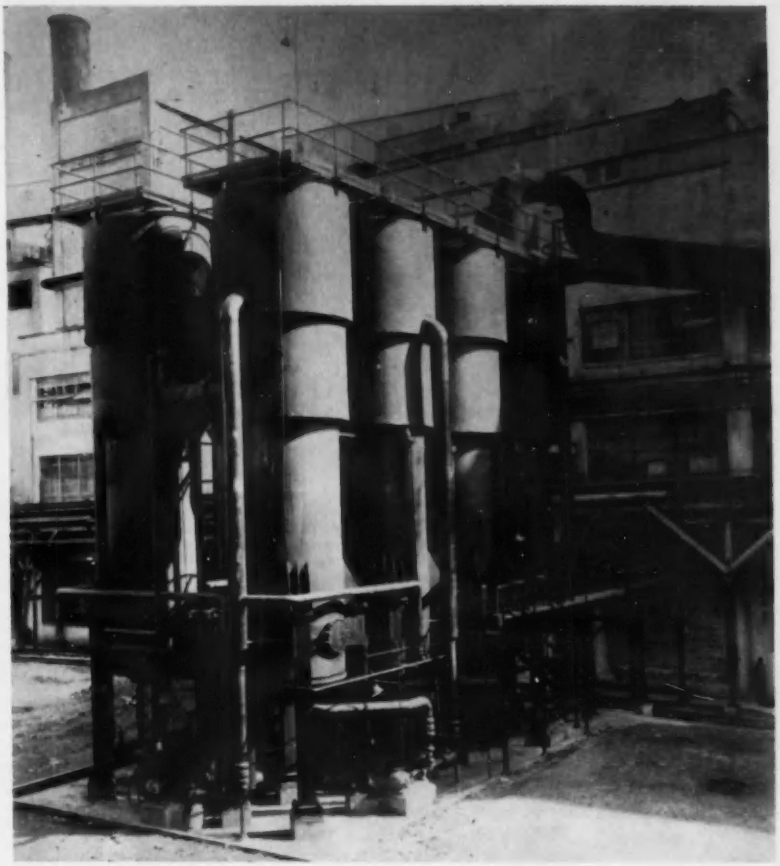
The following subjects will be discussed in regard to maintenance procedures of black liquor evaporators:

Tube Cleaning
Tube Replacement
Body Inspection
Piping
Condensers
Air Ejectors
Pumps
Mixed Liquor Operation

## Tube Cleaning

Tube corrosion and tube scaling or fouling are undoubtedly responsible for the largest share of evaporator maintenance costs. It is in this area that an effective maintenance program can produce significant cost reductions. Black liquor evaporator tubes can become scaled on the inside or liquor side by such agents as sodium sulphate, calcium carbonate, sodium aluminum silicate, as well as organic lignin compounds and fiber. The outside or vapor side of the tubes can become fouled by corrosion products resulting from sulphur compounds distilled from the black liquor. Scaling on the liquor side of the tube usually starts and is most severe in the high-density, high-temperature effects of the evaporator. Vapor side fouling is most troublesome in the lower-temperature, higher-vacuum effects. Since the scale is an additional resistance to heat transfer, the apparent temperature difference across the effect increases as the scale forms. The temperature difference is measured by subtracting the boiling liquor temperature from the steam temperature. As a particular effect becomes scaled, the operating records will show an increase in the temperature difference.

Severe and rapid liquor-side tube scaling is not as common today as it was some years ago. Modern recovery furnaces have high reduction efficiencies and consequently the danger of sodium sulphate scaling is greatly reduced. White liquor preparation equipment has been improved and this helps minimize the amount of calcium carbonate in the black liquor system. Silicate scale is no longer common because of improved furnace linings and lower silica content of make-up lime and salt cake. Most mills pulping highly resinous woods use soap skimming systems which help reduce the precipitation of organic compounds on the inside of the tubes in the high-density effects of the evaporator. The use of



**Exterior view of kraft mill septuple-effect black liquor evaporators.**

modern pulp washing equipment, often in conjunction with liquor filters, has substantially eliminated pulp fiber in the black liquor evaporator feed.

#### LIQUOR-SIDE CLEANING

Scaling of the liquor side of the evaporator tubes cannot be eliminated entirely. Organic precipitation, the severity of which varies with the liquor discharge concentration, occurs in the high-density effects, and many mills find that the most economical way of maintaining evaporator capacity is to boil out the equipment with water on a predetermined schedule. As the time between water boilouts is lengthened, the down time required to restore the heating surface to an acceptable cleanliness increases. This means that experimentation should dictate the best cleaning cycle. Water boilouts can be harmful if the water hardness is above acceptable limits. Care should be taken that enough water is used to prevent the hotter effects from boiling dry and precipitating a hardness scale on the tubes.

The black liquor system will almost always contain small amounts of calcium carbonate and silicates which will cause scaling and loss of capacity over comparatively long time periods. The scaling agents enter the system with the wood, water and make-up chemicals. This type of scale is most commonly removed by chemical cleaning, usually with inhibited acid. Frequency of cleaning depends on mill conditions, but one acid cleaning per year is probably typical. Here again it will be necessary to rely on experience to formulate the most economical cleaning cycle. Since black liquor evaporators are almost always designed so that any effect may be cut out of service for cleaning, the bodies can be cleaned one at a time while continuing to operate; or all bodies can be cleaned during a scheduled shutdown. Chemical cleaning, especially with mineral acids, is hazardous both to men and equipment. Although inhibitors are used, acid strengths and temperatures are critical and must be watched closely to prevent severe corrosion damage to the evaporator. An alkaline neutralization wash, followed by a very thorough water flushing after cleaning, is important. Many mills hire chemical cleaning specialists because of the hazards involved. The use of stainless steel tubing in black liquor evaporators has become quite common, and this has posed serious problems since stainless steel is susceptible to pitting corrosion in the presence of chlorides. For this reason cleaning agents such as sulfamic acid, phosphoric acid, citric acid and gluconic acid, are now being used as substitutes for the previously used hydrochloric acid.

#### VAPOR-SIDE CLEANING

Vapor-side fouling occurs in the latter effects of the evaporator. This is a result of the formation of corrosion products on the outside or vapor side of carbon steel tubes. This problem is eliminated by the use of stainless steel tubes. The corrosive agents are distilled from the liquor and are present in the noncondensable gases. The corrosion products are typically $Fe_2(SO_4)_3$, $FeS_2$ and $Fe_2O_3$. The scale is usually light and fluffy, but will harden with age and become progressively more difficult to remove. A regular cleaning program is essential in maintaining evaporator capacity. White liquor or a 10 to 15 per cent solution of sodium hydroxide is an effective scale removal agent for this scale. Either a single evaporator body or a group of bodies may be cleaned at one time. The choice will depend on the severity and extent of the scaling as well as the need for continuing operation of the evaporator during the cleaning operation. One method of scale removal is as follows:

1. Remove the body to be cleaned from service by substituting blanks in the vapor, liquor and condensate piping. The body should be isolated from the evaporator vent system by closing the vent valve.

2. Enter the vapor head and remove the vent plug in the top tubesheet.

3. Fill the steam chest of the body with undiluted white liquor or caustic. Connections suitable for filling the steam chest are usually provided on the body near the bottom tubesheet or in the connecting condensate piping.

4. Provisions should be made to maintain the temperature of the liquor at about 160°F. for at least 24 hours. This can be accomplished by admitting direct steam to the chest through the white liquor filling connection or another suitable opening.

5. Drain the white liquor to the

black liquor feed tank. Some mills make provisions to recover the diluted white liquor through the weak wash system.

**6.** Water flushing and loose scale removal constitute the next step. Removal of loose scale from the bottom tubesheet is most important and an effective method is quick water flushing. The cover on the manhole near the bottom tubesheet can be closed with one bolt or "C" clamps before filling the steam chest with water. When the manhole cover is opened, the body empties rapidly and the loose scale is flushed out. It may be necessary to flush the body several times to clean it thoroughly. The condensate drain connection should be checked to make sure that it is free of scale.

**7.** A hydrostatic test for leaking tubes can be conducted while the steam chest is filled with water. Inspection openings in the lower liquor chamber can be opened and the tubes checked for leaks. The top tubesheet should also be inspected for tube leaks.

An extra word of caution is warranted in regard to the hazards involved in acid and white liquor cleaning. Extreme care should be taken in entering an evaporator body after cleaning. Several unfortunate incidents have been reported in which men entering bodies have quickly become unconscious due to the presence of toxic fumes. The evaporator should be purged with air for a considerable time before entering. The use of a tag line and a standby man are strongly suggested.

An increasing number of mills employ chemical cleaning specialists for both liquor- and vapor-side cleaning. Mineral acids and oxidizing solvents together with complete auxiliary systems are used to provide the desired circulation and scale-flushing techniques.

## Tube Replacement

The first and generally the second effect of most black liquor evaporators are provided with Type 304 stainless steel tubes, with carbon steel tubes used in the remainder of the bodies. There has been a trend toward using stainless steel tubes in the latter effects and several evaporators built recently have stainless tubes throughout. Although stainless steel tubing in most mills is expected to have a service life at least as long as the remaining portions of the evaporator installation, carbon steel tubing is subject to corrosion and the expected service life may vary from 3 months to 10 years or longer.

**TABLE I**

**RELATIVE COST OF EVAPORATOR TUBING WHEN STAINLESS STEEL TUBING HAS A SERVICE LIFE OF 20 YEARS, AND CARBON STEEL TUBING HAS A SERVICE LIFE OF 1 YEAR.**

| | | Type 304 Stainless Steel Tubing | Carbon Steel Tubing |
|---|---|---|---|
| ( 1) | Amount of tubing per body | 14,400 ft. | 14,400 ft. |
| ( 2) | Tubing cost per ft. | $ 1.56 | $ 0.42 |
| ( 3) | Cost of capital (before taxes) | 20% | 20% |
| ( 4) | Tubing service life | 20 years | 1 year |
| ( 5) | Labor costs of installing one set of tubing | $ 2,000 | $ 2,000 |
| ( 6) | Cleaning costs for vapor side of tubes | — | $ 500/year |
| ( 7) | Present worth of original tube cost (1) × (2) | $22,464 | $ 6,048 |
| ( 8) | Present worth of yearly replacements [(7) + (5)] (4.87)* | — | $39,194 |
| ( 9) | Present worth of yearly cleaning (6) × 4.87* | — | $ 2,435 |
| (10) | Present worth of cost of 20 year service life (7) + (8) + (9) | $22,464 | $47,677 |

* Present worth factor for one dollar per year for 20 years at 20% interest.

The service life of carbon steel tubing depends on the particular mill conditions, and experience will be required to establish a replacement program. Tables I and II show how to determine the most economical tube material.

Several cases of premature failure of stainless steel tubing have been reported recently. The suspected cause of most of the failures is reported to be the corrosive attack of cleaning solutions, particularly hydrochloric acid. Some mills are now using inhibited phosphoric acid for cleaning, and there is a definite need for further investigation on other solvents and inhibitors.

Frequently a hydrostatic test of the tube bundle shows a few leaking tubes and the maintenance records indicate that the complete set of tubes should not require replacement. In such a case it is the usual practice to plug the tubes with wood plugs. Eventually, however, it becomes necessary to remove steel tubes for replacement. Several methods of removal are used. Any acceptable procedure, however, will stress care in avoiding damage to the tubesheets. Enlarged or damaged tube holes can make it difficult to get a properly rolled tube when new tubes are installed. Enlarged holes can lead to excessive tube rolling and the possibility of stress corrosion of stainless steel tubing.

One method of removing carbon steel tubes is as follows:

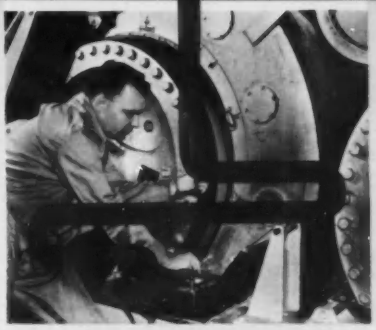
**1.** Remove the lower liquor chamber cover. This exposes the lower tubesheet. Take the bolted cover off the tube removal hole in the lower tubesheet. This hole will be near the manhole in the heating element shell. The removal hole will be larger in diameter than the tubes, which is needed because most steel tubes have an accumulation of scale on the outside and cannot be removed through the tube holes.

**2.** Enter the manhole on the shell and, using an oxyacetylene torch, burn out sections of the tubes nearest the manhole. The tube stub remaining in the lower tubesheet is driven up into the steam chest and removed through the manhole. The long section of the tube is driven down through the tubesheet and removed through the tube removal hole in the bottom tubesheet.

**3.** It is sometimes difficult to remove the tube stubs from the tubesheets with a knock-out bar. If this is the case, a step drill can be used to reduce the tube wall thickness. This relieves the pressure created by the original rolling. It is also possible to crimp the tube end with a sharp tool to relieve the pressure. Care should be taken to prevent damage to the tube holes.

Replacement tubes should be installed with care. The tube holes and tube ends, both inside and out, should be cleaned thoroughly. Foreign matter rolled into the joint can cause leaking. It is extremely desirable to roll all of the replacement tubes to a uniform tightness; both over and under rolling is to be avoided. The modern technique is to use tube expanders with automatic torque controls. These expanders pre-sense tightness and stop automatically when the preset torque is reached.

Maintenance records containing information on tube cleaning fre-



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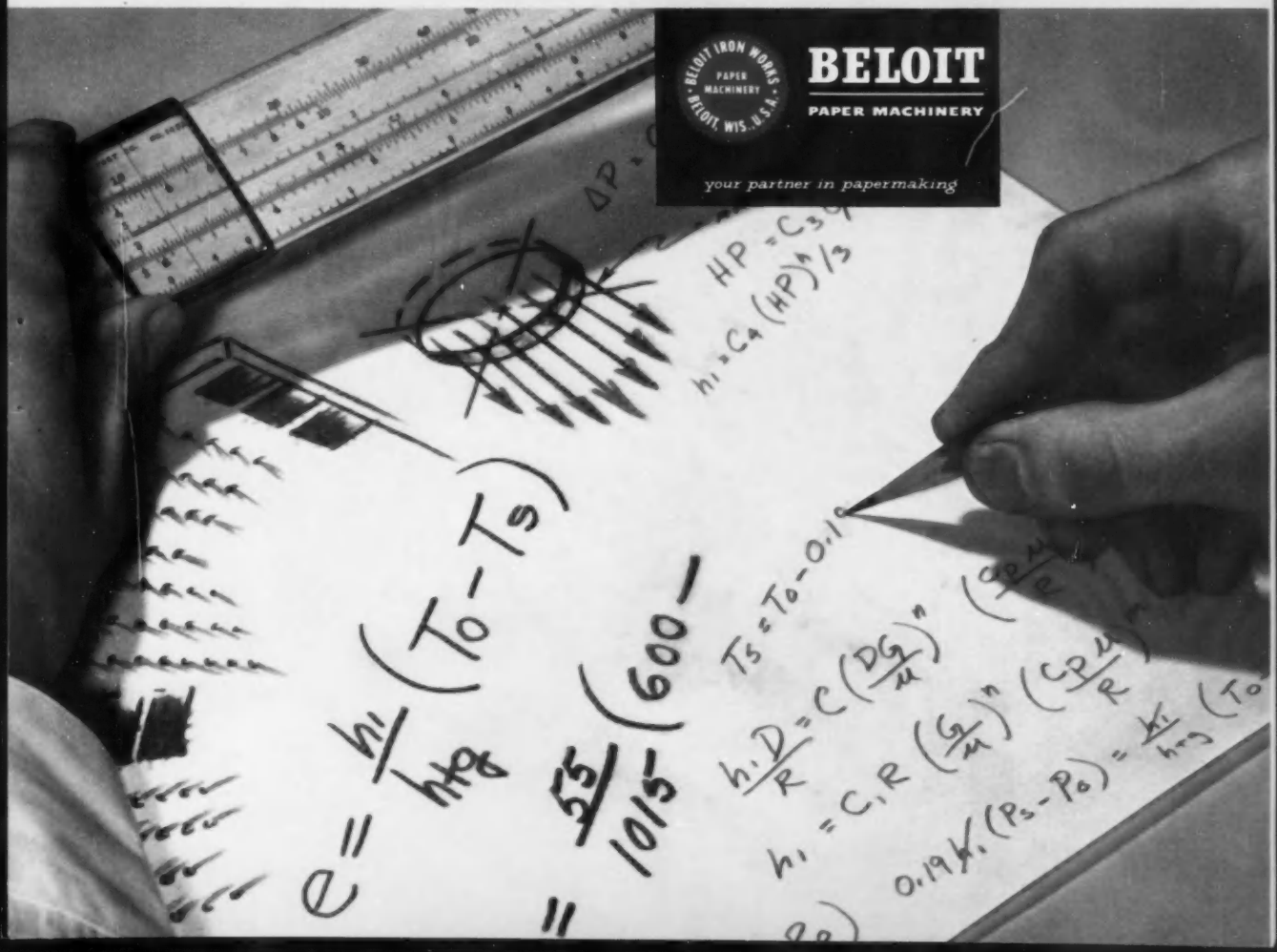

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quency, cleaning costs, tube service life and replacement labor costs are most valuable. It is this type of data that makes it possible to anticipate tube failure and the need for cleaning. It is far easier and less costly to plan for this type of work than to be faced with an unscheduled shut down. If maintenance costs are to be minimized, alternative materials of construction should be considered when replacement tubes are needed. Maintenance records can provide the required data for determining the most economical alternative. Tables No. 1 and No. 2 illustrate one method of calculating the relative cost of using alternate tube materials utilizing maintenance cost data. Based on the assumptions in Table No. 1, it is considerably less costly to use stainless steel tubing than carbon steel. The conclusion drawn from Table No. 2 is not quite as clear cut. While carbon steel tubing is less costly, there are factors which cannot easily be reduced to dollar terms. These are loss of production due to downtime for cleaning and reduced steam economy while one body is being retubed. These factors favor the higher-cost stainless steel. The above discussion is not meant to be a recommendation of tube material, but an illustration of how maintenance records can be used to reduce cost.

**TABLE II**

RELATIVE COST OF EVAPORATOR TUBING WHEN STAINLESS STEEL TUBING HAS A SERVICE LIFE OF 20 YEARS, AND CARBON STEEL TUBING HAS A SERVICE LIFE OF 5 YEARS.

| | | Type 304 Stainless Steel Tubing | Carbon Steel Tubing |
|---|---|---|---|
| ( 1) | Amount of tubing per evaporator body | 14,400 ft. | 14,400 ft. |
| ( 2) | Tubing cost per ft. | $ 1.56 | $ 0.42 |
| ( 3) | Cost of capital (before taxes) | 20% | 20% |
| ( 4) | Tubing service life | 20 years | 5 years |
| ( 5) | Labor cost of installing one set of tubing | $ 2,000 | $ 2,000 |
| ( 6) | Cleaning cost for vapor side of tubes | — | $ 1,000/year |
| ( 7) | Present worth of original tube cost (1) × (2) | $22,464 | $ 6,048 |
| ( 8) | Present worth of first replacement cost [(5) + (7)] (0.402) * | — | 3,235 |
| ( 9) | Present worth of second replacement cost [(5) + (7)] (0.162) ** | — | 1,304 |
| (10) | Present worth of third replacement cost [(5) + (7)] (0.065) *** | — | 523 |
| (11) | Present worth of yearly cleaning cost (6) × 4.87 | — | 4,870 |
| (12) | Present worth of cost of 20 year service life (7) + (8) + (9) + (10) + (11) | $22,464 | $15,980 |

* Present worth factor for one dollar due 5 years from present at 20% interest.
** Present worth factor for one dollar due 10 years from present at 20% interest.
*** Present worth factor for one dollar due 15 years from present at 20% interest.

## Body Inspections

The evaporator bodies and connecting piping are not generally maintenance problems. Those parts that are subject to rapid corrosion and erosion are usually protected with stainless steel. These include tubesheets, upper heating element shell, lower vapor head shell, and internal liquor deflector of the first effect and quite often the second effect. Although the other parts of the bodies are usually constructed of carbon steel, experience indicates that the expected service life is quite long. Isolated cases of rapid corrosion have been reported, however, and it is suggested that periodic inspections be conducted. The upper section of the first and second effect vapor heads, as well as the lower portion of all of the heating element shells, should be carefully checked since it is these areas that have shown rapid corrosion in a few mills.

Several types of entrainment separators are used in black liquor evaporators. Most are of the centrifugal type constructed of thick steel plate and are expected to have an extended service life. Periodic checks of metal thickness are good insurance, however. Some types of separators are built with several baffles, turning vanes, internal drain pipes and seal buckets. This type should be inspected for possible corrosion, if they are not constructed of stainless steel, as well as for plugging due to liquor and fiber.

## Piping

Interconnecting liquor and condensate piping is usually not troublesome from a corrosion standpoint. Most evaporators have stainless steel liquor piping on the high-temperature effects because experience indicates corrosion of mild steel is usually rapid in this area. Carbon steel liquor piping on the lower-temperature effects and steel condensate piping are expected to have long service life. Leaks do occur, however, and periodic hydrostatic tests are recommended. Piping leaks can be troublesome, especially in the high-vacuum effects, because erratic operation and foaming can result.

## Condensers

There are three general types of condensers used on black liquor evaporators. These are the direct-contact countercurrent, the direct-contact concurrent, and the tubular surface type. The concurrent types have water spray nozzles which require periodic inspection. The water nozzles can become worn, plugged or coated with scale, especially if the cooling water has a high mineral content. The countercurrent condensers are usually constructed of mild steel with internal baffling. Periodic checks of metal thickness and condition of internal baffles are good insurance against unexpected failure since several instances of rapid corrosion of the lower section of the condensers have been reported.

The surface type condenser, since it contains tubular condensing surface, is subject to loss of capacity due to tube corrosion and scaling. Corrosion products and entrained liquor can cause scaling on the vapor side of the tubes. Water-side scaling can occur due to the presence of dissolved salts and suspended solids in the cooling water. Cleaning procedures similar to those used for chemical cleaning of the evaporator bodies are frequently employed. Dissolved oxygen in the water can cause rapid corrosion of mild steel tubes, and for this reason many mills use stainless steel tubing in surface condensers. Most surface condensers are multi-pass on the water side. Pass baffle gaskets in the water chambers should be checked periodically for tightness, especially after acid cleaning. Leaking gaskets can cause loss of condensing capacity.

## Air Ejectors

Most black liquor evaporators use steam jet air ejectors for removing noncondensables. Air ejectors are re-

markably trouble-free when properly installed and maintained. Proper installation includes a steam separator and steam strainer ahead of the ejector steam inlets. The following is a brief check list for correcting faulty ejector operation:

1. Determine whether the ejector is operating properly or the system is at fault. Blank off the suction to the ejector and measure the no-load vacuum at the suction. The no-load vacuum for single-stage ejectors should be about 2″ Hg. absolute and for two-stage units about 0.5″ Hg. absolute.

2. Assuming the ejector is not operating satisfactorily, check for—

a. Low or fluctuating steam pressure

b. Wet steam

3. If the steam is satisfactory and the ejector is of two-stage type, shut off the high-vacuum jet. If the no-load vacuum is approximately 2″ Hg. absolute, then the low-vacuum ejector is operating properly. Should the ejector fail to maintain this vacuum, the low-vacuum ejector is at fault or there is a leak in the ejector. Blank off the suction of this stage and check the no-load vacuum. If operation is not correct, check for—

a. Clogged steam nozzle or steam strainer

b. Excess back pressure at the discharge

4. Disassembly is required if the above points do not provide correct operation. The nozzle and throat diameters should be checked and compared with the original dimensions. The diffuser should be examined for corrosion or wear since a rough surface, even without a change in diameter, can cause malfunction. Worn parts should be replaced.

5. The intercondenser should be checked if the low-vacuum ejector is found to be operating properly.

a. The inlet water temperature must be no higher than the design.

b. The tailpipe temperature should be about 20° F. above the inlet water temperature.

c. Excess amounts of cooling water cause flooding and would be indicated by pulsations in the low-vacuum ejector and discharge of water from the ejector.

d. Check for air leaks in the tailpipes.

e. The condenser should be examined for maloperation. The lower section of the condenser should be uniformly warm and the top cool (5 to 10° F. above the inlet water temperature). If hot spots are present, the internal baffles should be checked.

6. Assuming the preceding tests fail to locate the difficulty, the high-vacuum ejector stage should be tested as described above for the low-vacuum stage.

## Pumps

The required maintenance procedure on black liquor evaporator pumps is similar to that for the many other types of centrifugal pumps used in a kraft pulp mill. Because most evaporator pumps operate under vacuum, the packing should be watched carefully. Worn packing can seriously affect evaporator operation by causing excessive foaming and fluctuating pumping rates. The pump manufacturer's packing procedure should be followed. Water seal glands are usually provided on the pumps. The manufacturer's recommended seal water flow rates should be maintained at all times.

## Mixed Liquor Operation

Many kraft mills are now also making NSSC pulp, and the black liquors from both systems are mixed before evaporation. The problems encountered in handling the mixed liquors vary from mill to mill. It is difficult to correlate the severity of the difficulties with the relative amounts of the two liquors being concentrated, but it is generally found that the greater the percentage of NSSC solids in relation to the kraft solids, the more severe the problems. Some of the problems likely to occur in an integrated mill are—

1. Increased corrosion of mild steel, especially the lower heating element shells and the condensate piping.

2. Need for more frequent water boilouts in order to maintain capacity.

3. More frequent chemical cleaning of the liquor side of the tubes.

4. Formation of an organic precipitate which is sometimes found in the tubes and lower liquor chambers of the evaporator bodies as well as in the liquor piping.

## Summary

Due to the broad range of operating conditions, liquor properties and varied evaporator designs used in kraft mills, experience with a particular installation is required to establish an effective preventive maintenance program. Maintenance records are very helpful since the need for cleaning or repairs can frequently be anticipated and a costly unscheduled shutdown avoided. An example is given of how maintenance records can be used to determine the most economical tube material.

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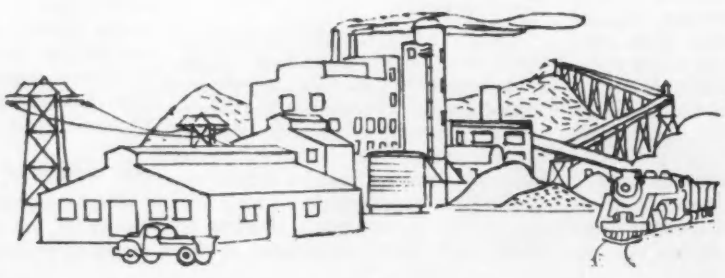

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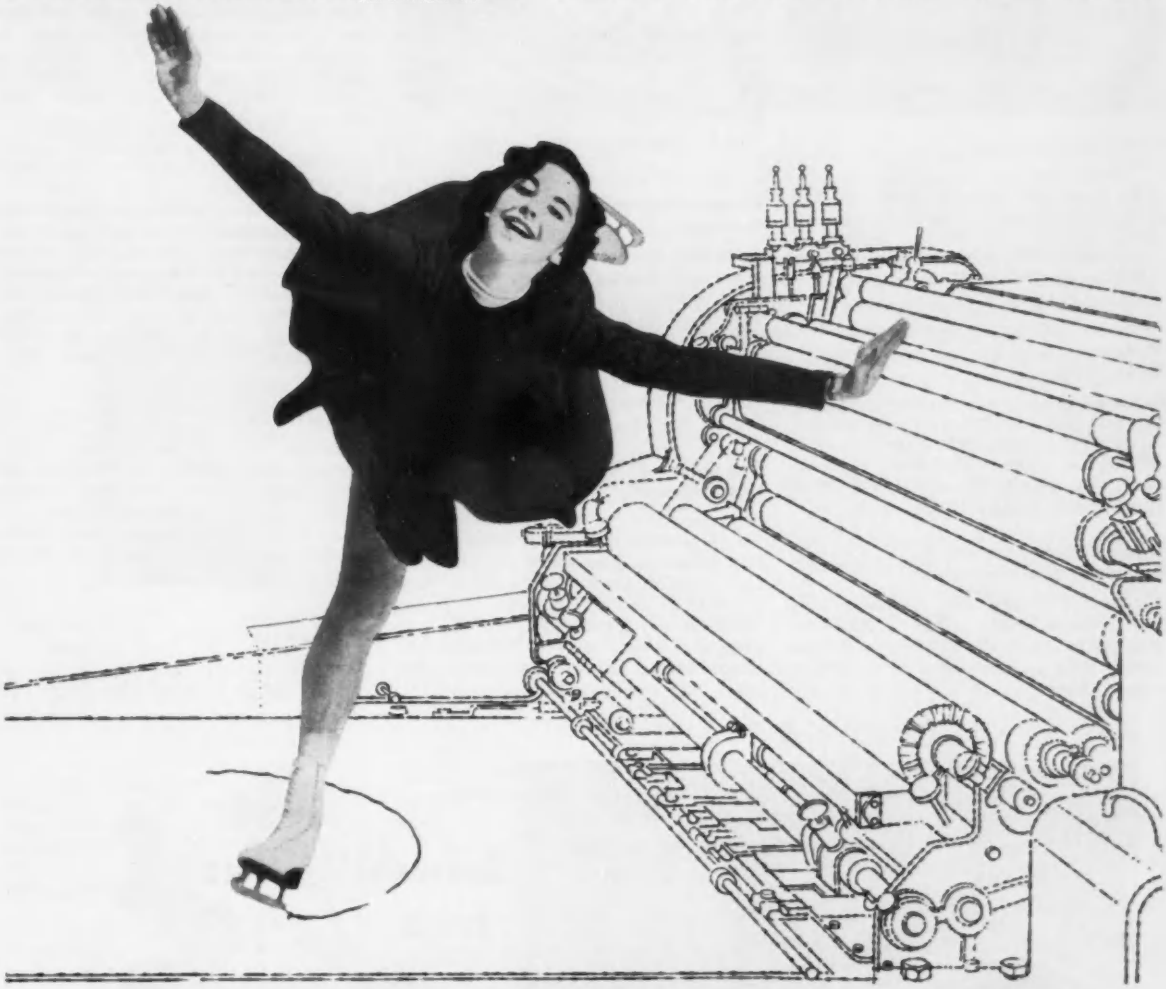

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# NEW LITERATURE

**Corrosion Resistance Chart**

Lists over 150 different chemicals and their recommended usage. Also shows which gasket materials are needed for the various chemicals. Chart J-CRC. OPW-Jordan, 6013 Wiehe Road, Cincinnati 13, Ohio.

**Dynapump Model 670E**

Contains description of this extremely compact low-cost "canned" centrifugal pump that cannot leak. Also lists specifications. Form 59-1-670. Fostoria Corp., Dynapump Div., P. O. Box 35-6, Huntingdon Valley, Pa.

**How Corrosion Attacks Industrial Water Systems**

Explains how and why boiler, cooling and process water systems are constantly plagued by corrosion. Data Sheet. Betz Laboratories, Inc., Gillingham & Worth Sts., Philadelphia 24, Pa.

**Controlled Volume Pumps**

Describes their Oliver diaphragm slurry pump capable of metering slurries with up to 60 per cent solids at a controlled volume accuracy of plus or minus 2.0 per cent. Flow volume can be varied by remote control electric timer or unique electrical probe mechanism. Bulletin 1158. Milton Roy Co., 1300 E. Mermaid Lane, Philadelphia 18, Pa.

**Karbate Entrainment Separators**

Tells how Karbate impervious graphite entrainment separator modules, type MV are used for effective separation of entrained liquids from corrosive gas streams. Also includes information on design and construction of the two styles available. Supplement to Catalog Section S-6900. National Carbon Co., 535 Fifth Ave., New York 17, N. Y.

**Standards of Wage Determination**

99p pamphlet by Paul Bullock. Price 75c. Available from Institute of Industrial Relations, University of California, Los Angeles, Calif. Covers the general subjects of comparisons, cost of living, ability to pay, productivity, family budgets, purchasing power, technical and miscellaneous factors and a final summary and conclusions.

**Who Gets Hurt?**

Uses a humorous approach, multicolored cartoons and concise text to discuss on-the-job injuries. Also explains the type of worker most likely to be accident prone, etc. 16p pamphlet. Single copy free from the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

**Jordan Controls**

Features expanded line of linear and rotary actuators; six basic types of remote positioners; machine tool point-to-point position and rate control; punch card formula and program control; closed loop process control. Bulletin J-105. Jordan Controls, Inc., 3235 West Hampton Ave., Milwaukee 9, Wis.

**Joy Air Compressors**

Describes the WN-114 stationary compressor. Also includes specifications on three basic models of the semi-radially constructed units ranging from 1385 c.f.m. to 1948 c.f.m. at 125 p.s.i. Bulletin A-72. Joy Mfg. Co., Henry W. Oliver Bldg., Pittsburgh 22, Pa.

**Sealol Design Data**

Contains design data on mechanical seals which is of particular interest to

Carthage 60" Slab Chipper with horizontal feed. A five knife machine furnished with or without power feed and with gravity or blowing discharge. Capacity approximately 10 cords per hour. A companion chipper to our popular 39" horizontal slab chipper.

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engineers and designers. Two nomograms facilitate the determination of frictional heat and power absorption for rotating mechanical seals. Also provides chart on PV rating of mechanical seals. 4p Folder. Sealol Corp., Providence 5, R. I.

**Solvofen HM**

Describes the properties and applications of this dyeing assistant and solvent, which is finding increasing application in the textile, paper manufacturing and printing fields. This is chemically stable and completely miscible with water and most organic solvents. Brochure. Antara Chemicals, 435 Hudson St., New York 14, N. Y.

**Freight Car Handling**

Shows the cost-cutting versatility of Whiting's Trackmobile; how in one minute it's a truck running on rubber tires on the road and next rolls across a railroad track, drops a separate set of wheels down on the rails and is ready to take on freight car handling problems. Also can be used as a snow plow or materials handling truck. 32p Booklet. Whiting Corp., 157th & Lathrop Ave., Harvey, Ill.

**G-E Round-chart Recorder**

Describes features, application, measureable parameters, and specifications for this newly announced line. Also includes dimensions and a list of available charts and scales. Bulletin GEZ-2969. General Electric Co., Schenectady 5, N. Y.

**Heavy-Duty Synchronous Motors**

Covers the E-M line of bracket-bearing synchronous motors which are rated 60 h.p. and up, suitable for standard voltage connection and built in a variety of enclosures for every requirement. Leaflet 1100-PRD-252. Leaflet 4400-PRD-263 describes a new line of variable speed magnetic drives designed expressly for pump application. Electric Machinery Mfg. Co., Minneapolis 13, Minn.

**A-C Car Shaker**

Gives advantages of this 3½-ton shaker which is specifically designed for plants where unloading of hopper-bottom cars


# PUMPAGE

Goulds reports on trends in pulp and paper

**PAPER BOOM.** While other industries increased production 60% during the past twelve years, the paper industry increased its production by 80%. Two things combine to assure continued gains in production in the decade ahead: new people and new products. This year's population growth is expected to expand the market for paper. And population is expected to grow at an ever-increasing rate, enabling us to reach the 200-million mark by 1967. Another promise for stepped-up sales during the 60's lies in new technology. Paper is entering its scientific age. More and better research will create new products and new markets for old ones. Plastics and aluminum will capture some markets but not as fast as paper opens up others. It all adds up to a favorable balance between capacity and production—probably by next year.

**SOBER LOOK AT LIQUOR.** Gnawing away at your pumps, liquor loses its appetite when you switch to glass. The Goulds-Pfaudler glassed pump gives the same corrosion resistance you get in a glassed-steel reactor. Its tough, permanently-fused-to-metal glass fights chlorine dioxide's corrosive bite, resists the violent attacks of all concentrated bleaches. If your pump life is short—write us for details on this glassed centrifugal. Ask for Bulletin 725.2

**SLEDGE IN A SLURRY.** An absent-minded worker left a sledge hammer in a suction pipe at a western mill. Pulled along later by the flow, the hammer hit the pump impeller with a bang. Damage? Naturally—but not what you'd expect. We replaced only the impeller and side plate. The shaft was undamaged. Parts right out of stock. No dismantling of suction or discharge piping. We don't suggest tossing a sledge hammer into your pumpage—but if you do, it's nice to have a Goulds in your system.

# OBSERVATIONS

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by A. W. Woodbury, Assistant Sales Manager, Goulds Pumps

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does not warrant installation of a 5-ton unit, and where smaller capital investment is desirable. Leaflet 26B9438. Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

**Dodge Chain and Sprockets**

Includes general information on the installation of roller chain drives, calculation of center distances, horsepower ratings, conveyor engineering, and instructions for lubrication and maintenance. Photographs and diagrams show construction details and advantages of Taper-Lock sprockets. Also covers Taper-Lock bushings for special requirements and Taper-Lock chain couplings. Bulletin A691. Dodge Mfg. Corp., Mishawaka, Ind.

**Screw Conveyors and Feeders**

Shows how screw conveyors are used for conveying and elevating, distributing, reclaiming, collecting, mixing, blending, agitating, aerating, heating and cooling materials. Also contains a list of materials for which the conveyors may be used. Book 2989. Link-Belt Co., Dept. PR, Prudential Plaza, Chicago 1, Ill.

**Welding Pad Gauges**

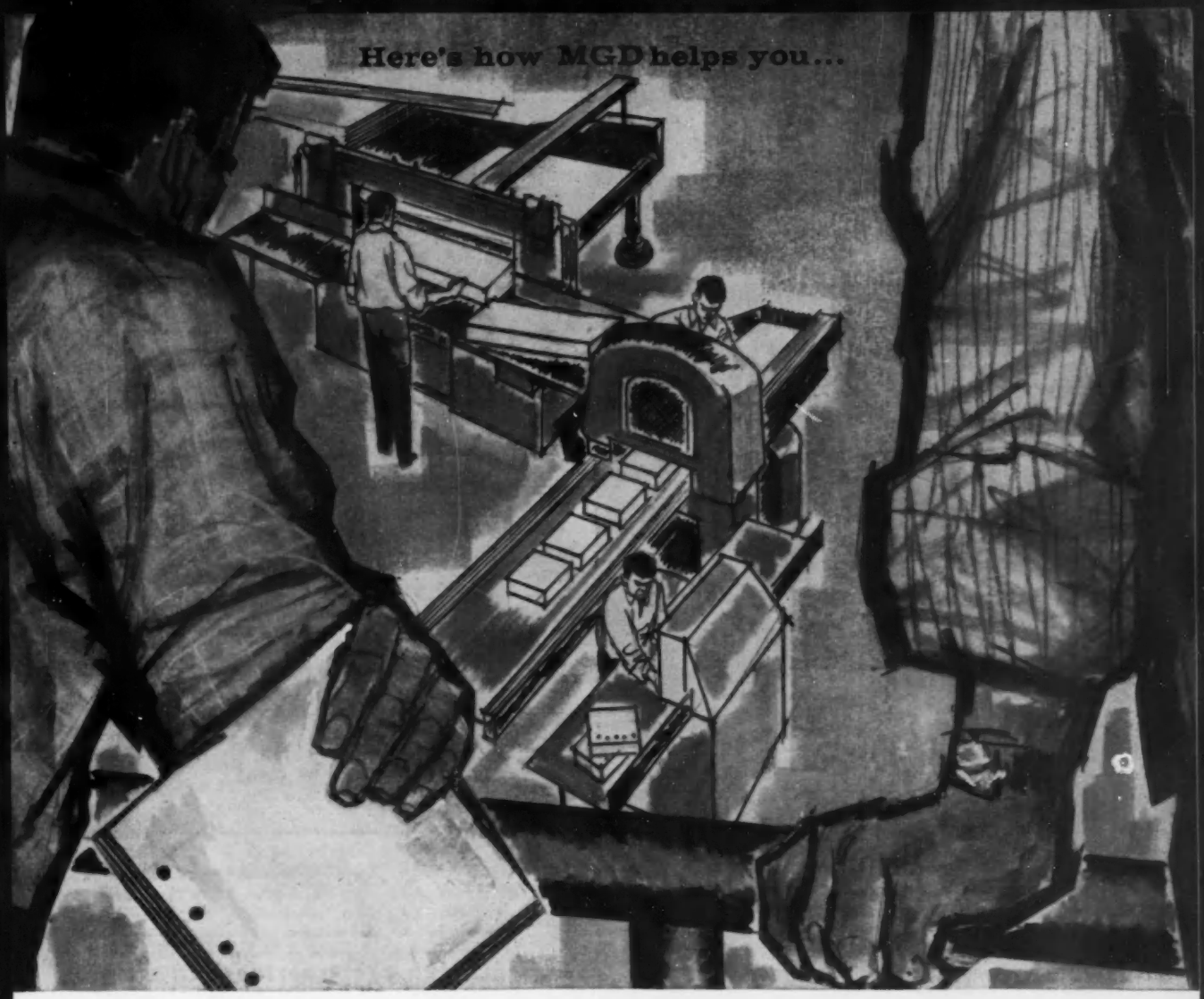
Gives features and specifications of these gauges which can be welded right onto a tank, still, vessel or other liquid containing structure, thus becoming an integral part of it. Available in either reflex or transparent types. Data Unit 362. Jerguson Gage & Valve Co., 80 Adams St., Burlington, Mass.

**PVAc Brochure**

Describes Darex vinyl acetate homopolymer and copolymer emulsions, their properties, and suggested applications. Also serves as a jacket for filing D&A technical data sheets on specific products. Dewey & Almy Chemical Div./ W. R. Grace & Co., Cambridge 40, Mass.

**Portable Scale Truck**

Incorporates the scale as an integral part of the lift truck which eliminates the necessity of weighing the truck itself and supplies a net weight of the material handled. Cir. No. 10-205 Section VI. Lewis-Shepard, Watertown, Mass.

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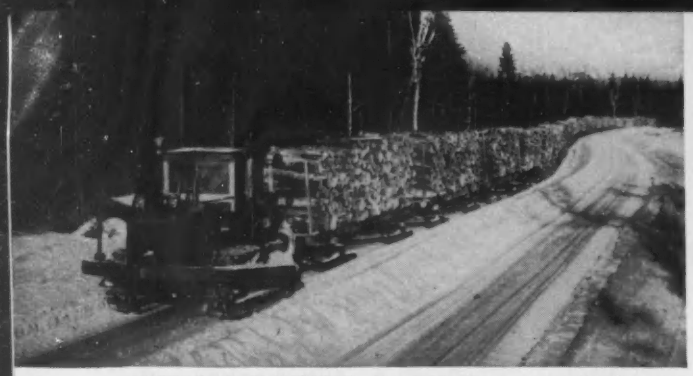
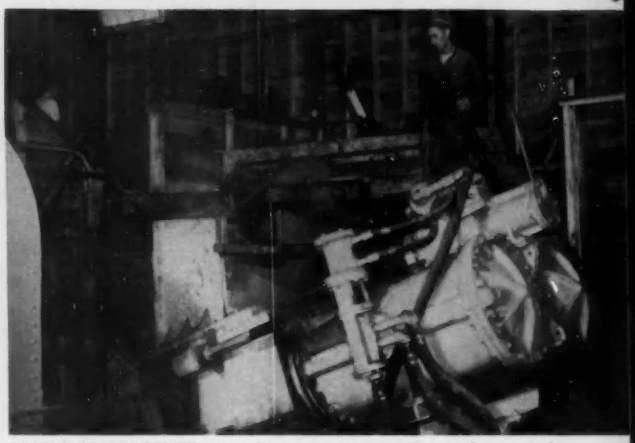


**OVERLAND TRANSPORT:** Great Northern Paper diesel tractor pulls a train of 4-foot pulpwood to a river landing. The Woodlands Department, responsible for cutting and delivering timber to the mill, lubricates most of its mechanized equipment with Texaco.

**WATER TRANSPORT:** One of two modern diesel tugs operated by Great Northern Paper, the "West Branch No. 1" hitches a log boom for a trip across one of the large lakes on the water road to the mills. Like most of the equipment in the entire Great Northern Paper operation, it's Texaco-lubricated.

**POWER SUPPLY:** Ripogenus Dam supplies water to McKay Hydro-electric Station, one of 7 operated by Great Northern Paper. This power system is rated 30,200 hp. Texaco lubricates everything, from dam gate mechanisms here to turbines in the power station.



**PULP MANUFACTURE:** One of 16 magazine grinders in the ground-wood pulp mill at East Millinocket, Me., where Texaco lubricants are also used.

**FROM ITS WOODLANDS TO ITS MILLS IN MILLINOCKET AND EAST MILLINOCKET, ME. . . .**

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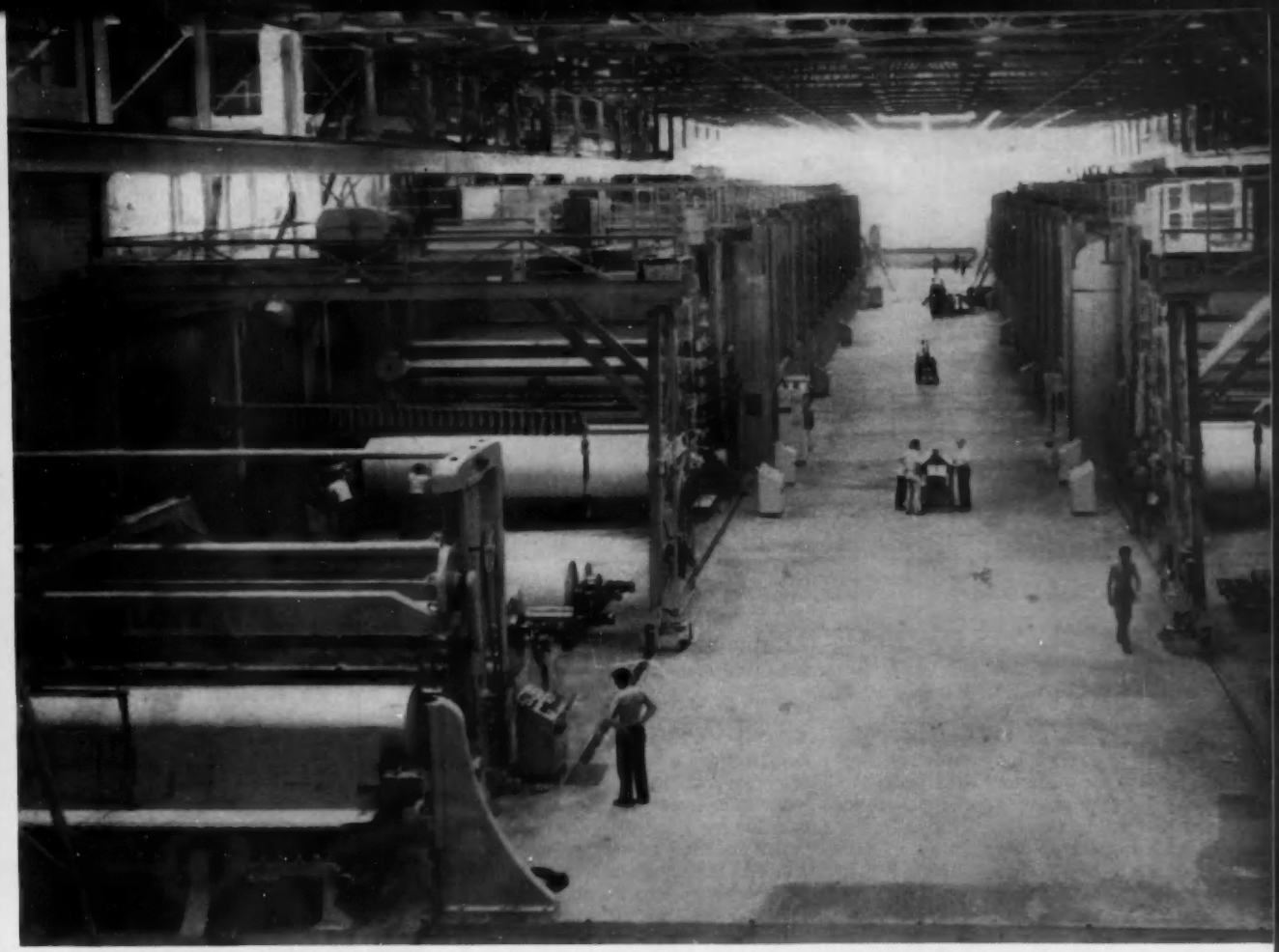
**Through analysis of lubrication needs.** The Texaco Organized Lubrication Plan starts with a thorough study of the lubrication requirements of every piece of woodlands, transportation, power, and mill equipment.

**Through consolidation of lubricants.** Based on the study, and consistent with optimum equipment performance, the fewest possible lubricants are recommended. Multi-purpose lubricants are widely used. This way, Great Northern Paper keeps lubricant inventories low, cuts the cost of handling, storage and distribution, and helps its crews avoid the dangers of misapplication.

**Through proper scheduling of lubrication.** Following the Texaco analysis and consolidation of lubricants comes a complete, carefully worked-out lubrication schedule to keep equipment in working order and eliminate failure.



**PAPER MANUFACTURE:** These 375-foot Beloit newsprint machines have added 40% to Great Northern's capacity. Production rate is 300 tons each per day; operating at speeds of 2,300 ft/min. and can reach speeds of 2,500 ft/min. plus. Texaco Paper Machine Oil HD lubricates these machines; provides detergency, dispersion, high resistance to oxidation, rust-protection, and extremely high film strength at all temperatures. These and other qualities make it one of the best paper mill lubricants available.

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# PJT NEWS OF SUPPLIERS

WISCONSIN WIRE WORKS technical field and headquarters staff attending the five-day Technical Seminar: Top row—F. J. Halloin, H. B. Hill Jr., N. J. McCurdie, K. C. Nichols, W. P. Wright, G. M. Boyes, N. R. Dover; bottom row—G. T. Clayton, V. J. Risley, W. N. Dreyer and D. A. Krueger.

**Wisconsin Wire Works'** technical engineering staff and field personnel covered the newest production advancements in the ever-changing paper-making industry in detail during a five-day Technical Seminar held at the plant in Appleton, Wis., February 15 through 19.

During the afternoons and evenings, detailed studies were made of the problems encountered at the wet end of paper machines as well as the variations in operating conditions from one mill to the other which make it necessary to "Custom tailor" fourdrinier wires to each particular paper machine. Characteristics of individual wire strand and finished cloth were also studied and discussed.

Wisconsin Wire Works is holding these seminars periodically to keep its technical field and headquarters staff abreast of the newest advancements in paper making.

**American Potash & Chemical Corp.** has transferred Dean L. Browne from its Lindsay Chemical Division in West Chicago, Ill., to the firm's Los Angeles office.

Mr. Browne, who was formerly market development representative for Lindsay Division, has assumed the same responsibilities in the company's over-all market development program.

**Planet Corp.**, Lansing, Mich., manufacturer of custom engineered material handling systems and automation equipment, has announced the promotion of three engineers.

Robert E. Place has been named to fill the newly created position of chief estimator. He was chief engineer.

Mr. Place's former assistant, Joseph Brown, has been advanced to chief engineer.

Daniel Smith, heretofore senior design engineer, has been promoted to production manager.

**Allis-Chalmers Manufacturing Co.**, Milwaukee, Wis., has appointed Kenneth A. Briggs and James J. Dolan, Jr., to its Industries Group sales offices in Milwaukee and Columbus respectively.

Eugene J. Thompson, formerly a sales representative in the Washington, D. C., office, has been transferred to the Tampa district office as a sales representative.

Mr. Briggs is a mechanical engineering graduate of Tulane University and Mr. Dolan a graduate electrical engineer of Manhattan College. Both recently completed the Allis-Chalmers training course for graduate engineers.

Mr. Thompson joined Allis-Chalmers in 1956 and is a graduate of Randolf-Macon college.

New appointees to the service department at Allis-Chalmers West Allis Works are Fred Chambers, Jr., and Robert C. Divine.

Mr. Chambers, a mechanical engineering graduate of Alabama Polytechnic Institute, recently completed Allis-Chalmers graduate training course.

Mr. Divine has been a serviceman in Allis-Chalmers Pacific region. He is an electrical engineering graduate of the University of Toledo and has been with Allis-Chalmers service department since 1953.

**Asten-Hill Mfg. Co.** announces that Tom King, who joined Aston-Hill recently, will succeed John Roslund, who died recently.

**Stebbins Engineering and Manufacturing Co.**, announces that John E. Maxson, who since 1951 has been secretary and sales manager, has been elected to the position of executive vice president.

Mr. Maxson, a native of Watertown, N. Y., received his bachelor's degree in mechanical engineering from Rensselaer Polytechnic Institute and, prior to joining Stebbins in 1941, was with New York Air Brake Co. and the Crucible Steel Co. of America.

J. E. Maxson

Peter de Florez

**Miehle-Goss-Dexter Inc.**, announces that the de Florez Co. of Englewood, N. J., an engineering firm active in research and development work for both U. S. Government and commercial clients, and well known for a modern line of specialized graphic arts machinery, is now a wholly owned subsidiary. According to a joint statement by J. E. Eddy, MGD chairman, and R. C. Corlett, president, the Chicago-based leader in the manufacture of printing presses and graphic arts equipment acquired the outstanding minority shares in de Florez late last month.

"De Florez's new status will enable the various MGD manufacturing divisions to take fuller advantage of the subsidiary's technical talent and experience," Mr. Eddy stated. "De Florez will continue its research and development contract work for outside clients as before," he added.

The company was founded in 1948 by Luis de Florez, Rear Admiral USNR (Ret.), former director of Special Devices Section of the Navy

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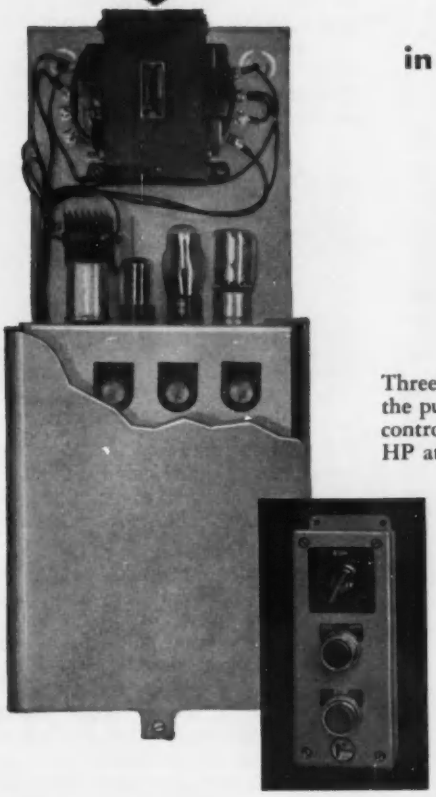

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Standard control features include on-off clutch control, infinite speed adjustment, constant speed regulation, and jogging. Any of a variety of special features may be easily and economically added to the standard control by the installation of a single resin-encapsulated circuit.

Send for complete information covering design and operation of the new models ACM-903 and 904 Ajusto-Spede Drives. Read how the new K-2 Control provides infinite speed adjustment, on-off clutch control, constant speed control, jogging, threading, cascading, and acceleration control.

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Bureau of Aeronautics. President and chief executive officer is Peter de Florez, who received his B.S. from M.I.T., in 1938. Admiral de Florez remains active in the firm as a director and consultant.

**Joseph T. Ryerson & Son, Inc.,** Chicago, Ill., has appointed Wallace E. Felldin as sales manager of its New York plant. He succeeds Henry B. Williams who was named special assistant and sales consultant to the general manager.

Mr. Felldin became associated with the Ryerson company in 1946 and has spent most of his time in sales work. He was named manager of sheet and strip sales in 1954, and in 1959 was appointed assistant sales manager and a district sales manager.

**Research-Cottrell, Inc.,** Bound Brook, N. J., has elected J. William Hinkley president, following the resignation of James M. Knox, due to illness. Mr. Knox has been elected vice chairman of the board of directors of Research-Cottrell.

Mr. Hinkley is also president of Research Corp., a foundation to provide means for scientific investigation. Research-Cottrell, Inc., is a wholly owned subsidiary.

**Stowe-Woodward, Inc.,** announces that a new plant facility for the rubber covering of rolls is being built in Neenah, Wis., by J. W. Hewitt Machine Co. Rolls covered in the new plant will be used in the paper mill, paper converting, textile, plastic, tannery and many other industries.

Included in orders placed for equipping the new plant is what will be the world's largest two-wheel grinder for the surfacing of rolls. Fitted with two grinding wheels, the machine will grind rolls up to 63 inches in diameter and up to 380-inch face. According to David W. Stapleton, president of Stowe-Woodward, Inc., the new plant "will bring to the Central-North United States a roll manufacturing facility which can handle the largest rolls in the world. Marketing studies have shown us that the growth of this area in the 1960's will undoubtedly be such that our new plant expenditures will be more than justified. Furthermore, we are pleased to continue the association with the Hewitt organization."

Scheduled for completion in July of 1960, the Stowe-Woodward plant will contain complete facilities for the covering of Suction rolls, Rectifier rolls, and the firm's unique "Densite" roll which is plastic-covered to resist both heat and acid.


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W. E. Archer

R. F. Stewart

**Joy Manufacturing Co.,** Los Angeles, Calif., has promoted William E. Archer to manager of research and development for the Western Precipitation Division.

Mr. Archer joined Western Precipitation in 1950 as a service engineer in the New York office, later moving to the home office in Los Angeles. He most recently was chief development engineer for the division, directing among other things the gas flow and design studies of electrostatic precipitators and experimental work on new types of Multiclone mechanical dust collectors.

Also announced was the appointment of Robert F. Stewart as vice president and assistant general manager of Joy's Western Precipitation Division.

Prior to this appointment Mr. Stewart has been vice president for

sales of the dust collecting equipment of the division. He has served in a number of capacities including sales engineer, chief estimator, and sales manager since joining Western Precipitation in 1946.

**The Foxboro Co.**, Foxboro, Mass., terminating its former sales representative arrangement in the Northwest, has opened two new branch offices—one in Portland, Ore., the other in Seattle, Wash. With the establishment of these company-staffed offices, Foxboro now offers direct, undivided application engineering assistance to instrument users in the Northwest.

The Portland office is staffed by F. J. Renner, branch manager; L. E. Schlavin, sales engineer; and W. C. Kenzler, service engineer. Serving the Seattle area are I. D. Hummel, branch manager; D. O. Nielsen, sales engineer; C. L. Liakos, office engineer; and W. E. Talbert, service engineer. In addition to these two offices, Foxboro also maintains a regional office, branch factory and warehouse at San Leandro, Calif.

The addition of these new offices brings to 61 the number of Foxboro branches serving instrument users throughout the United States.

G. Williams

A. Peck

**Manchester Machine Co.**, Middletown, Ohio, has appointed Arthur Peck manager of manufacturing and Glenn Williams project engineer.

Manchester Machine makes complete machines of the fourdrinier and cylinder types as well as component parts, such as suction rolls and presses, dryers, reels, calenders and winders.

Mr. Peck, who was born in New Westminster, B. C., Canada, attended local schools and graduated from the Vancouver Technical School. He started with the Vancouver Iron & Engineering Works as a designer and was successively promoted to chief engineer, plant engineer, general superintendent and in 1952 works manager. In 1957 he became assistant general manager of the company and a year later joined Aluminum Industries as works manager.

Mr. Williams, who is an engineer graduate from Pennsylvania State College, was formerly a project engineer for Scott Paper Co. and later a plant engineer for D. M. Bare Paper Co.

**Chain Belt Co.**, Milwaukee, has appointed Bernard G. Schneider as conveyor equipment sales manager and Frank G. Stuller as chief engineer of the conveyor and process equipment division.

Both Mr. Schneider and Mr. Stuller joined Chain Belt as apprentice draftsmen. Mr. Schneider started in 1926. He was named manager of engineering services in 1951 and chief engineer of the conveyor and process equipment division in 1955.

Also announced is the appointment of J. Walter Snavely as assistant district sales manager of Chain Belt's Milwaukee district sales office.

Mr. Snavely, presently marketing manager of Chain Belt's conveyor equipment, joined the company in 1927. In 1934 he became sales manager of Chain Belt's Houston district sales office and in 1941 returned to Milwaukee as a

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sales and estimating engineer in the company's conveyor and process equipment division. Since then he has served in that division as an assistant to the sales manager, manager of engineering, manager of the conveyor equipment section and assistant division manager.

J. L. Pickens

V. Woodside

**Olin Mathieson Chemical Corp.** has named Vernon Woodside manager of sales development for heavy chemicals in its Chemicals Division. Also announced is the appointment of J. L. Pickens as manager of field sales for heavy chemicals. Both men will be located in Baltimore.

Mr. Woodside was district sales manager in the corporation's New Orleans office. He will be replaced there by George H. Nusloch who has been a sales representative in the division's New Orleans, Chicago and Atlanta offices.

Mr. Pickens was district manager of the Houston sales office. He is succeeded by M. E. Shoemaker who was assistant product manager of the acids-sulphur operations, located in Baltimore.

**Allis-Chalmers Manufacturing Co.**, Milwaukee, Wis., announces reorganization of its processing machinery department with attendant realignment of product lines and the creation of the following new positions:

Frank E. Briber, Jr., assistant manager, processing machinery department; C. E. Burnett, manager, pyro-processing section; J. K. Gibson, sales manager, cement machinery; W. A. Shockley, sales manager, mineral processing machinery; Glenn Hanson, process development functions; and R. M. Bliemeister, supervisory engineer, product engineering, pyro-processing machinery;

A. L. Stewart manager of the crushing and grinding machinery section; A. K. Boszhardt, sales manager, crushing machinery; C. A. Rowland, sales manager, grinding machinery; W. A. Patterson, supervisory engineer, product engineering, crushing machinery; E. J. Klovers, supervisory engineer, product engineering grinding machinery;

J. E. Fink manager, screening machinery section; M. P. Hahn, supervisory engineer, product engineering, screening machinery; H. D. Vanderlip, manager, chemical processing and food machinery section; K. W. Borges, assistant chief draftsman and supervisory engineer, product engineering, chemical processing and food machinery; E. C. Mertz, manager, engineering project section, and D. L. F. Wilson, sales manager, renewal parts.

**Dow Chemical International, Ltd.**, S.A., announces plans for construction of a styrene-butadiene latex plant in Rotterdam, The Netherlands.

The plant will be built and operated by Dow's wholly owned Dutch subsidiary, Nederlandsche Dow Maatschappij N.V., at the site of its present terminal and warehousing facilities in the Third Petroleum Harbor at Rotterdam. Investment in the new plant will total more than 7½ million Dutch guilders ($2 million).

Completion of the plant is scheduled for early spring of 1961, and its initial annual capacity is expected to be large enough to cover the increasing styrene-butadiene latex requirements of Western Europe.

The plant will supply latex to manufacturers of industrial paints and packaging materials and to textile and paper industries.

Explaining plans for the new facility, C. B. Branch, president, said: "The increasing demand for styrene-butadiene latex in West European markets has approached the capacity level of an economical production unit. This has prompted our decision to create a source of supply close to the growing market.

**Graver Water Conditioning Co.**, New York, manufacturer of industrial and municipal liquid treatment equipment, has announced the appointment of six new sales representatives in Latin America and the Caribbean area. Three of the new representatives will carry Graver's complete line of water treatment and

**Keep your eye on our Classified Advertising Section**

chemical processing equipment; two will handle Graver sugar clarifiers, and one will offer all three types of equipment.

Representatives for sugar clarifiers will offer Graver's redesigned unit called the Prima-Sep. The others will handle equipment for making water suitable for use in the home, in industry and in hydro-electric stations, and systems for special chemical processing applications. Among the items to be offered are water clarifiers and softeners; ion exchange equipment to remove dissolved impurities from liquids; filters; units to heat water and remove oxygen and other gases, and complete plants for removal of iron from water and reuse of sewage plant effluent.

The new representatives for water and chemical treatment equipment include: Navarro y MacMurray, S.A., Calle 26 Este No. 5-33, Panama City, Panama; A. T. Schiller y Cia., Yerbal 341, Buenos Aires, Argentina; Mastermax, Ltd., 44 Barry Street, Kingston, Jamaica, B.W.I.

Representaciones Asociadas, Ltda., with main offices at Carrera la, No. 11-7, Cali, Colombia, has been named for water treatment equipment, chemical processing systems and sugar clarifiers. This firm has branch offices in Barranquilla, Bogota and Medellin.

J. W. Ryznar

W. P. Hettinger, Jr.

**Nalco Chemical Co.**, Chicago, Ill., has promoted John W. Ryznar, vice president and technical director, to the new position of technical representative in corporate management.

Dr. Ryznar will be responsible for planning, guiding and coordinating all technical activities of the company and its subsidiaries. Dr. Ryznar joined Nalco as a research chemist in 1937 and was named research director in 1945, technical director in 1950, and vice president in 1957.

William P. Hettinger, Jr., has been named Nalco's director of research. While having broader responsibility, he will continue to coordinate research activity for the company's Catalyst Division, for which he has been head of research since joining Nalco in 1957.


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The new Nash 5308-A shown above, has four separate suction inlets, each of which functions independently of the others. This offers the machine operator great flexibility, since these may be used in any desired combination to produce a variety of capacities and vacuums.

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Why Crankshafts Fail

Cutting Maintenance Costs in the Refining of Groundwood Rejects

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Hardwood-Sawdust for Cold Caustic Pulp Appears Feasible

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ALP Starts Up Alaska's Newest MgO Sulphite Mill at Sitka

Which of the Three Possible Kinds of Stock Chest Agitation to Use

Paper Industry Is Moving into a New High

Weighing Chipper Sawdust Saves Knives

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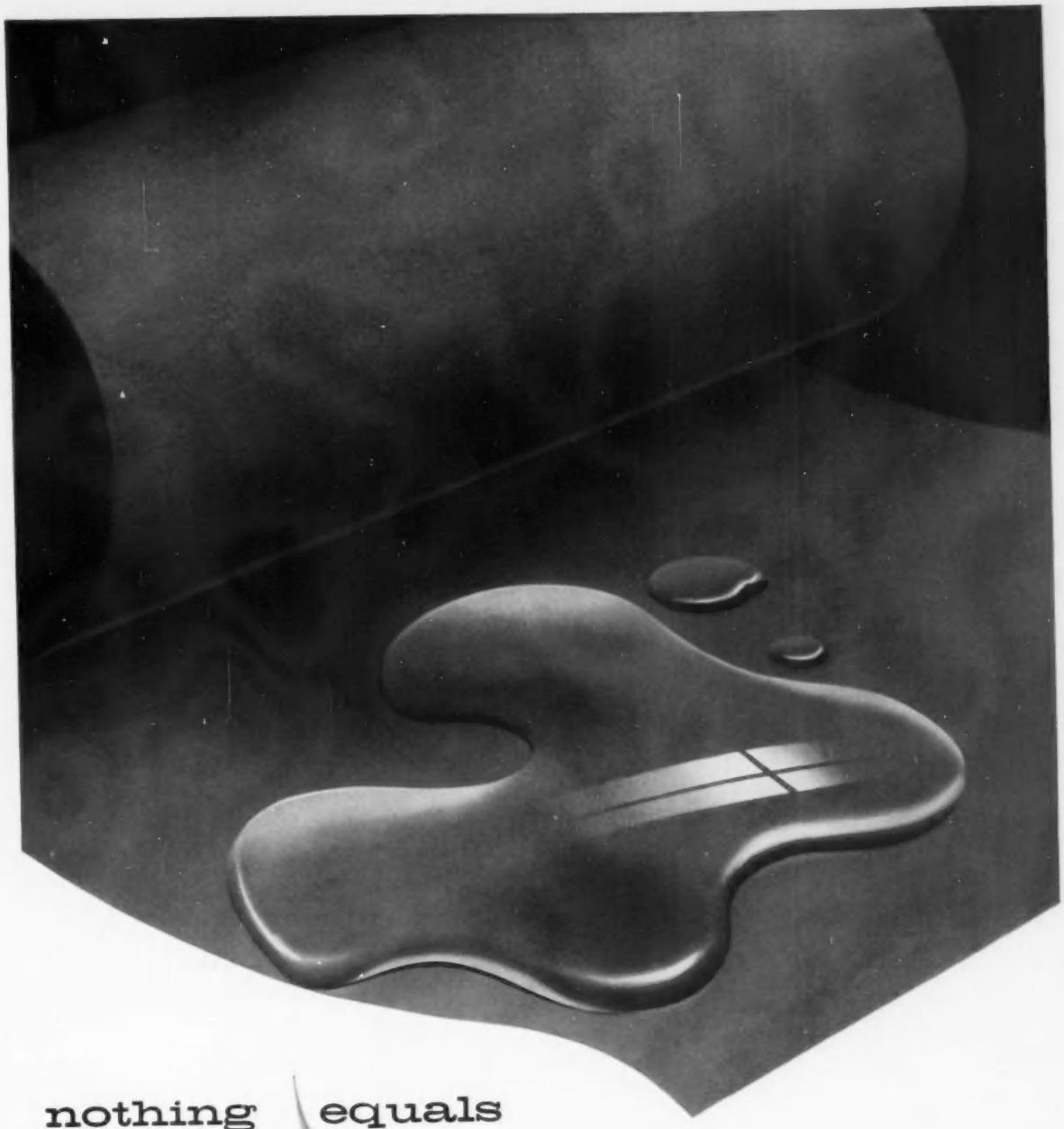

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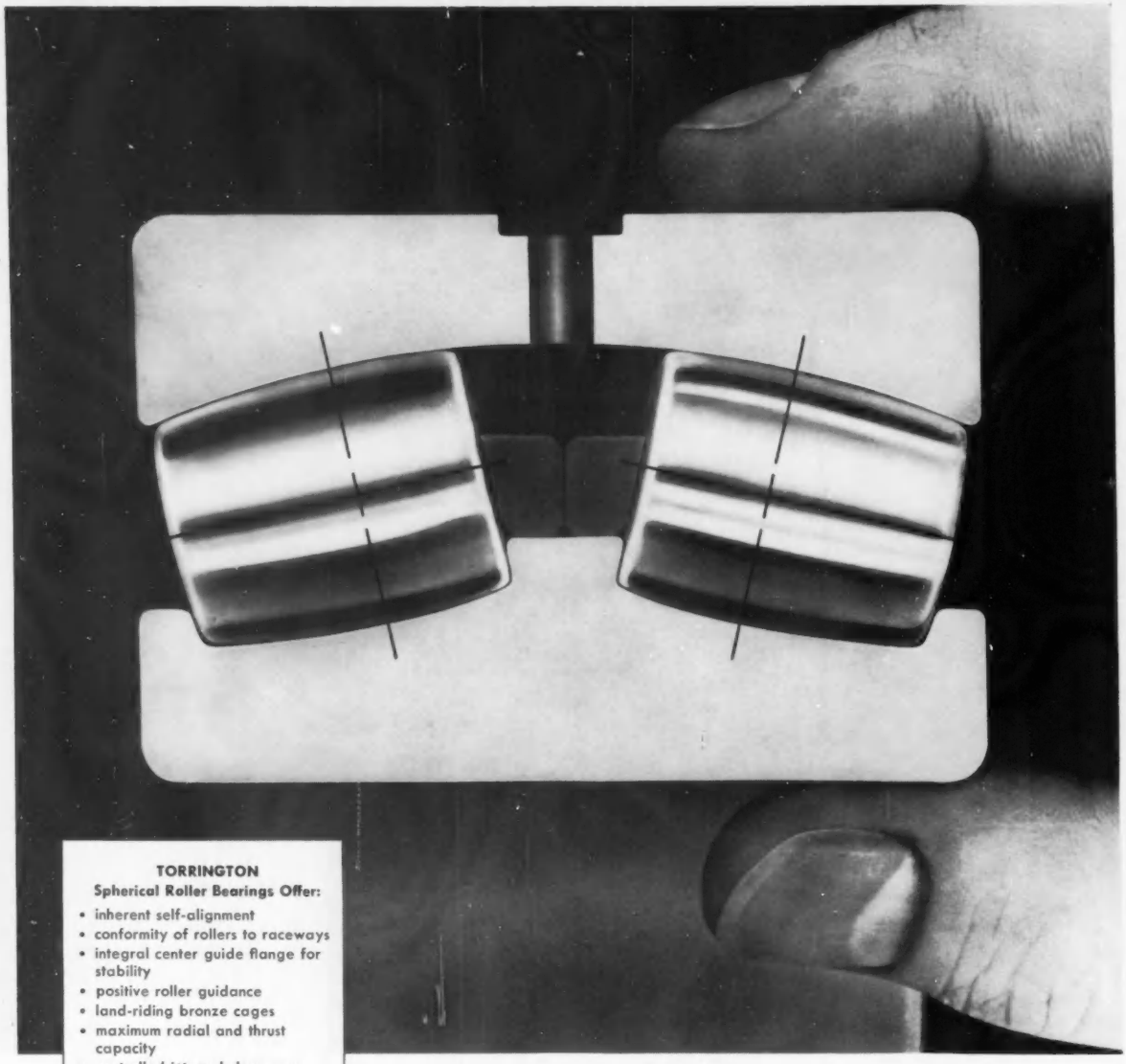

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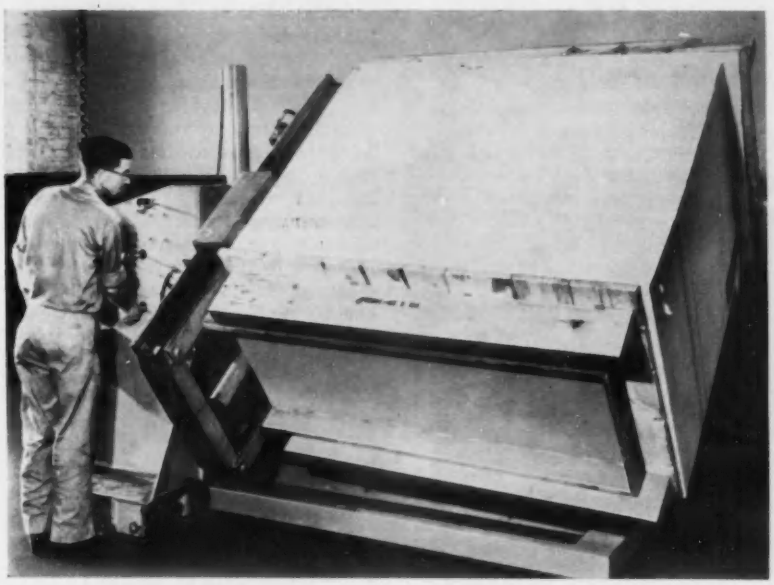
# NEW EQUIPMENT & SUPPLIES



## Skid Turner Simplifies Handling of Paper

In addition to the savings in both time and labor which soon equal its initial cost, the Southworth Skid Turner, is said to offer certain operating advantages such as the reduction of waste, more accurate trim, easier skid to pallet transfer, and a quicker method of inverting paper.

With the Model ST-5 Skid Turner it takes one man a total of 55 seconds to turn a full skid of curly or wavy stock so that the curl is down and a more accurate trim may be obtained, especially on stock that is embossed on one side only.

Where bulkiness results from air trapped between sheets with vellum finishes or rough embossing, the skid load can be compressed prior to trimming or transfer to a pallet for shipment with the turner.

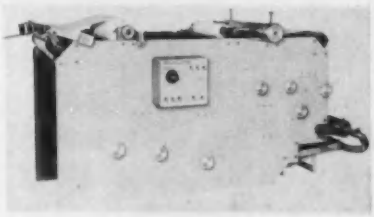
An especially designed side structure gives additional support of the load during the turn, thus providing a three-way positive control and eliminating the possibility of squeeze-induced wrinkling, offset or other damage.

Model ST-5 is fully portable, completely will turn any type skid, handling sizes from 28 inches by 38 inches to 52 inches by 76 inches, and accommodating heights from 24 inches up to 74 inches, exclusive of the skid.

With a capacity of up to 5,000 pounds, the Southworth Skid Turner is ready to operate as soon as delivered. When not turning skids, it is designed to serve as a lift table as well. The turner has a length of 96 inches, a width of 60 inches, and is 96 inches high. Motor specifications, 3 h.p., 220-440 volts, 3 phase.

## Trailing Blade-Air Knife Laboratory Coater

S. C. Slifkin announces the availability of a laboratory type coating unit for paper webs up to nine inches in width. The unit will apply a coating using either the trailing blade doctor device or the air knife unit included in the design. Drying is by means of a group of individually controlled infra red heaters. A variable speed drive is included, and normal coating speeds are about 10 feet per minute, depending upon the nature of the coating formulation used.



The air knife is supplied with a pressure gauge, but the unit is designed for an auxiliary air source, to be supplied by the user. Power requirements are 220 volts, a.c., 60 cycle, single phase. Additional data will be supplied upon request by writing to S. C. Slifkin, 11616 Amherst Court, Plymouth, Mich.

## Wheel Loader Built For Stability

Most apparent feature of the Caterpillar Traxcavator No. 944 is the locating of all lift arms and hydraulic cylinders ahead of the operator's compartment. Lift arms are made of solid, two-inch plate, joined by a cross-member of box-type construction. Optimum visibility is provided by tapering the lift arms.

Control of the loader is performed by a completely enclosed hydraulic system. All hydraulic fluid is full-flow filtered. Hydraulic power comes from a 40 g.p.m., vane type pump, driven from an accessory drive directly-connected to the engine.

Dumping reach of the Traxcavator totals 31.75 inches at maximum height. The maximum dumping height is 9 feet, 2 inches. The bucket

is provided with a tip back angle of 41° at ground level. Tip back at maximum height is 50° An automatic bucket positioner and lift kickout, operated hydraulically, are standard equipment.

Powered by either a gasolene or diesel engine, the No. 944 is fitted with a 2-cubic yard capacity bucket as standard equipment. Both the gasolene and diesel engines are rated at 105 net horsepower. The maximum rating of the diesel engine is 135 horsepower.

The power train includes a torque converter and power shift transmission, which is a two-speed forward, two speed reverse, planetary transmission. It consists of four in-line gear trains, each with separate

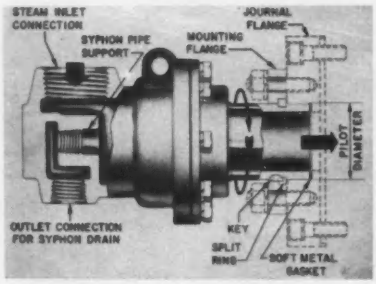
clutch. Two of the planetary trains provide directional control while the other two provide gear speed selection. In addition, the power train included a manually shifted range selector transmission, which provides the machine with a 4-wheel drive work range, or two-wheel drive travel range. The transmission is geared to provide 25 per cent faster travel speed in reverse.

Control of the machine direction and speed is afforded by control levers: the forward-reverse lever; the speed selector (hi-lo) lever; and the range selector (4-wheel, 2-wheel drive) lever. The steering system is hydraulically boosted. Axle oscillation of the steered wheels is accomplished by the use of a center point system.

Available accessories include a 2-cubic yard side dump bucket, a 3-cubic yard light material bucket, and bucket tooth groups for the standard bucket. Also offered is a fiberglass cab equipped with wide entry doors, windshield wipers, and double strength safety glass. For handling of logs and palletized loads, a lumber fork with adjustable tines is available. Tines measures 2.5 by 5 by 4 inches and can be set at spacings of 40, 50, 60, and 70 inches. The standards are 5 feet high and the fork weighs 1,340 pounds. Further information is available upon request from the Caterpillar Tractor Co., Peoria, Ill.

## Introduces Flanged Rotary Joints

Convenience in installation and control of concentricity are features of Type CF rotary joints developed




by Barco Manufacturing Co. The design eliminates need for threaded connection of the rotary sleeve.

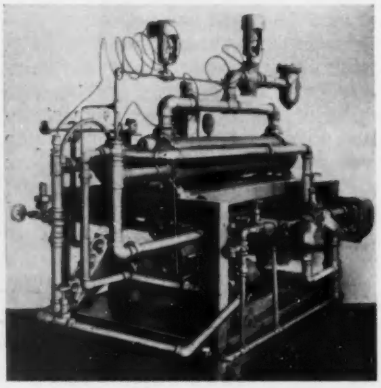
The new Type CF joint is equipped with a machined straight rotating sleeve, in which the outside pilot diameter is held to close tolerances. Attachment of the joint to rotating drum, dryer, or roll is by means of a mounting flange keyed to the rotating sleeve and drawn up against a spacing ring. Only an end wrench is required to draw up or loosen four nuts on the mounting flange studs. Sealing of the joint against leakage is by use of a soft metal gasket.

Internally, the Type CF joint features self-lubricating bearings and seal. The seal is self-adjusting for wear, eliminating any need for periodic take up or adjustment, says the manufacturer. Type CF flanged joints are now available in 2, 2½, and 3 inch sizes suitable for up to 200 p.s.i saturated steam or 400 p.s.i. cold working pressure. Also, hot oil, under 100 p.s.i. can be handled up to 500°F. All sizes are built so that they can be used for either single flow or syphon flow service. Detailed information is available from Barco Manufacturing Co., Dept. J. 29, 500 Hough St., Barrington, Ill.

## Paste Size Emulsifier Constantly Recirculates

An automatic paste size emulsifier has been developed jointly by Milton Roy Co., Philadelphia, and Monsanto Chemical Co. The packaged system responds automatically to machine demands and when not producing finished size emulsion, it recirculates and reheats size paste. This recirculation feature keeps a supply of paste size to a constant temperature thereby ensuring uniform emulsion consistency.

The packaged emulsifier provides a continuous supply of fresh size, and because there is no prolonged storage, the size does not oxidize or develop excessive foam. Even metastable emulsions or those of limited stability can be used. The emulsifier uses low pressure steam and occupies but 30 square feet of floor space.



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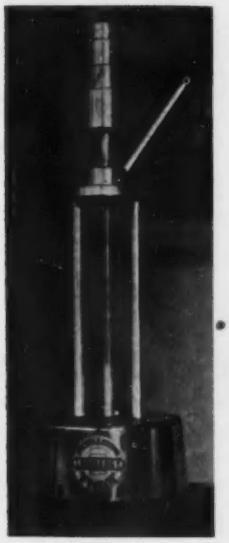
Manual adjustments permit the production of the desired size consistency. Standard units emulsify up to 30,000 pounds per day of fortified rosin-based size pastes of 70 or 77 per cent solids content to finish sizes of two to six per cent solids as desired. They are supplied as completely wired and piped packages ready for connection to paste, water, steam and electrical lines. For more information write to Milton Roy Co., 1300 East Mermaid Lane, Philadelphia 18, Pa.

## Viscometer Made In France

The Laray Viscometer, manufactured by Lhomargy S. A. of Draveil, France, has been specially designed for determining the viscosity of all



kinds of liquids and viscous materials but particularly letterpress and offset litho inks. It is in principle an extrusion instrument operating by measuring the relative velocity of two essentially parallel surfaces separated by a thin film of the material being examined when a constant force is applied to the movable member.

In operation, a machined cylindrical rod is free to move inside a short thick-walled tube, the internal diameter of which is slightly greater than that of the rod. A support, fitted with a spirit level, holds the tube vertically so that the rod will slide through the tube by its own weight.

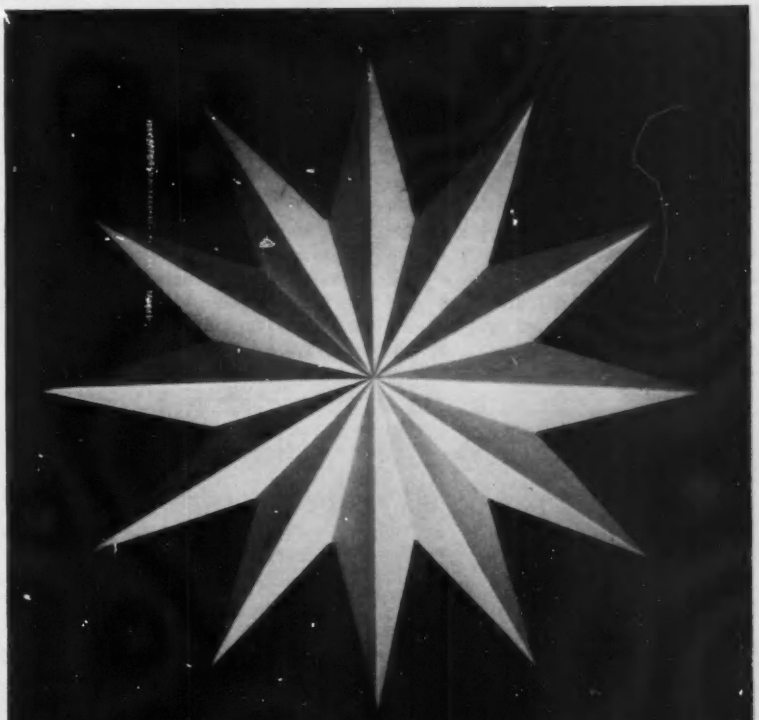
Two marks, 10 cm apart, on the upright of the support, indicate the distance through which the rod should travel. The material which occupies the annular space between the rod and the tube will hinder the free fall of the rod. The time which the rod takes to travel the distance of 10 cm is measured, and this time is proportional to the viscosity of the material being examined.

Weights can be applied to the rod so as to measure viscosity under different rates of shear. From the figures so obtained it is possible to plot the rheological curve of the product, from which its plastic viscosity and yield value, if any, may be determined. The tracing of the curve is made easy by using the chart which accompanies the viscometer.

## Fibrous Resins Available For Specialty Papers

Fibrous vinyl and styrene resins are now available in developmental quantities for tests in specialty paper applications, it was announced by Union Carbide Plastics Co., division of Union Carbide Corp.

The Bakelite fibrous resins have the appearance of cellulose pulp. Fibers are very irregular in structure with many fine fibrils extending out from the main fiber bundle. Diameters vary from 2 to 200 microns and lengths range from very short

**Whites can be uniform and bright!**

**with Sandoz Leucophor BS Liquid**

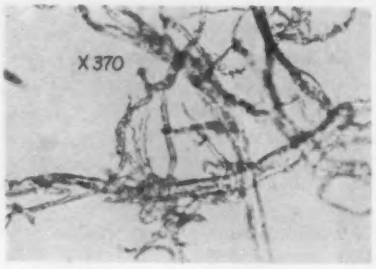
Freedom from graniting . . . even-ness of strike . . . level, bright tone . . . call it what you will . . . these terms tell the technical story of Leucophor BS Liquid. From the time this Sandoz product first came on the market, tests and paper mill men's testimony have proved conclusively: Leucophor BS Liquid gives bleached papers and boards a brightness that is startling as well as economical.

Examine your own fluorescent white papers under an ultra-violet light. If they show graniting, now is the time to put in a call for Sandoz. And for a quick report on the why and how of fluorescent brightness measurements, 'phone or write:—SANDOZ, INC., 61-63 Van Dam Street, New York 13, New York—ALgonquin 5-1700.

District Offices: Charlotte, Cincinnati, Fair Lawn, N. J., Hudson, Mass., Los Angeles, Philadelphia.

SANDOZ

THINKS AHEAD WITH PAPER




to a maximum of 3/16 inches. The vinyl resin is designated VXKA-6112 and the styrene resin, SXKA-0121.

Since the structure of the fibrous resins (see photomicrograph) is similar to that of cellulosic fiber, they can be incorporated in paper with conventional equipment run at normal speeds. White water loss is said to be low. Hot calendered papers containing fibrous resin are smooth and densely structured, and take on a parchment-like appearance. Dimensional stability, grease resistance; and wet tensile strength are increased. Both as-made and calendered papers containing the resins are heat sealable.

Current tests indicate that the fibrous resins may find applications in laminates, molding, and in asbestos paper for improved bonding.

## Coating Latex Highly Improved

The Dow Chemical Co. has described a latex for pigmented paper and paperboard coatings as a type of styrene/butadiene latex markedly different from previous copolymers.

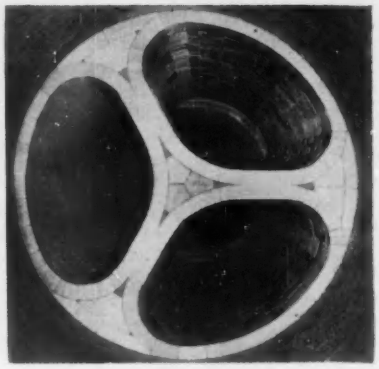
Field trials have shown improvement of wet pick resistance and indications of body stock strengthening, coupled with excellent dry pick resistance.

In addition, they said the improved starch compatibility of the latex eliminates the need for protective colloid.

High shear stability promises maximum utility on all types of commercial coating equipment. Furthermore, Dow goes on, the latex imparts the highest degree of printability.

## Trefoil Design For Rotary Kilns

A trefoil refractory heat exchange design has been developed by Harbison-Walker Refractories Co. for rotary limestone and lime sludge kilns. An early installation in a 10-foot diameter kiln, has already been in service for three years with the



promise of considerably longer life. A number of other kilns using this design now have been in service for a long time.

The preheated charge, passing through the trefoil, tends to moderate the temperature in the hottest zone. Accordingly, the development of excessive accretions in high temperature zones with certain fuels may be reduced and consequently lining life is extended. Other important overall benefits claims the company are fuel savings and increased production in kilns which are not overloaded beyond rated capacities.

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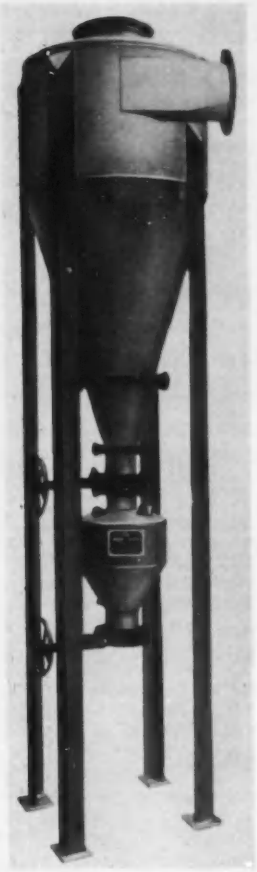

"PRECLEANER" is a low pressure drop centrifugal cleaner for removing trash, and rubble from furnish. It may be used ahead of screens or high pressure drop cleaners or in stock preparation systems at pulpers. Its advantages are claimed to be: Large capacity, small space requirements, no moving parts, low pump head requirements. Units are furnished in either mild or stainless steel, with manually operated valves or push button control. Three sizes are available to handle volumes from 1500 to 6000 g.p.m. with a single unit. The Precleaner was developed by the Nichols Engineering & Research Corp., New York, N. Y.

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**men, money or machinery?**

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**Classified Advertising**

**Section**

# Prices of Fibers

## MARKET WOOD PULP

FIRST QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

Delivered Basis

| | U.S. | Canadian | Swedish | Finnish | Norwegian |
|---|---|---|---|---|---|
| Groundwood | $ 82.50/ 90.00 | $82.50/ 90.00 | §90.00/ — | §80.00/ — | §90.00/ — |
| Bleached Gw'd | $ 97.50/100.00 | $97.50/100.00 | | | |
| Kraft, Blchd. | 157.00/ — | 160.00/162.50 | §157.00/162.50* | | §157.50/ — |
| Kraft, Blchd. Hdwd. | 152.00/ — | | §137.00/ — | | |
| Kraft, Semi-bleached. | 140.00/ — | 140.00/ — | | | |
| Kraft, Unbl. | 117.50/125.00 | 125.00/130.00 | †125.00/130.00 | 125.00/ — | |
| Sulphite, Blchd. | ‡150.00/155.00 | ‡150.00/155.00 | *155.00/ — | *155.00/ — | 155.00/ — |
| Sulphite, Bl. Hdwd. | 150.00/ — | | | | |
| Sulphite, Unblchd. | 135.00/ — | 135.00/ — | †135.00/ — | *135.00/ — | |
| Sulphite, Unb'l, Gl'sn | | 140.00/ — | †134.00/ — | | |
| Soda, Blchd. | 147.00/150.00 | 150.00/ — | | | |

§ On Dock Atlantic Ports. * Freight allowed. † Varying Freight Allowances.
‡ Depending on Brightness.

## COTTON LINTERS

F.O.B. OIL MILLS
WEEK ENDED MARCH 1

| | Atlanta | Memphis | Dallas | Los Angeles |
|---|---|---|---|---|
| Grade 1 | n.a. | n.a. | n.a. | n.a. |
| 2 | n.a. | n.a. | n.a. | n.a. |
| 3 | $7.50/7.00 | $8.50/7.75 | $7.50/7.00 | n.a. |
| 4 | 7.00/6.25 | 7.25/6.25 | 6.50/6.25 | n.a. |
| 5 | 6.25/5.75 | 6.00/5.50 | 6.00/5.50 | 8.50/7.00 |
| 6 | 5.75/4.75 | 5.25/5.00 | 5.25/5.00 | 6.50/4.50 |
| 7 | 4.75/4.25 | 4.50/4.00 | 4.75/4.00 | 4.25/4.00 |

## WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers and brokers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

| | New York | Boston | Chicago | Los Angeles |
|---|---|---|---|---|
| | Mar. 7 | Mar. 7 | March | March |
| No. 1 Mixed Paper | $ 7.00/ 9.00 | 9.00/ 11.00 | 8.00/ — | 12.00/ 13.00 |
| No. 1 News | 14.00/ 15.00 | 14.00/ 15.00 | 16.00/ — | 14.00/ — |
| Overissue News (Lg. size) | 13.00/ 15.00 | 13.00/ 15.00 | 21.00/ — | 19.00/ 20.00 |
| Mill Wrappers | 19.00/ 22.00 | 13.00/ 15.00 | 11.00/ — | 14.00/ 15.00 |
| Old Corrugated Containers | 22.00/ 23.00 | 21.50/ 22.00 | 20.00/ — | 23.00/ — |
| Super Resorted Kraft Paper | 35.00/ 40.00 | — / — | 30.00/ — | 55.00/ — |
| New Double Kr. Ld. Corr. Cuts | 32.50/ 35.00 | 35.00/ — | 32.50/ — | 35.00/ — |
| (Semi-chem. medium) | 45.00/ — | 45.00/ — | 42.50/ — | — / — |
| New 100% Kraft Corr. Cuts | 40.00/ 42.50 | — / — | 57.50/ — | — / — |
| New Br. Kraft, Env. Cuts | 70.00/ 75.00 | 70.00/ 75.00 | 52.50/ — | 55.00/ — |
| New Br. Kr. Bag Waste Prntd. | 55.00/ 60.00 | 55.00/ 60.00 | 52.50/ — | 55.00/ — |
| New Br. Kr. Bag Waste Unprintd. | 60.00/ 65.00 | 65.00/ 75.00 | 60.00/ — | 60.00/ — |
| No. 1 Groundwood Shvs. | 25.00/ 30.00 | 25.00/ 30.00 | 22.00/ — | 32.50/ 35.00 |
| White Newsblanks | 50.00/ 55.00 | 50.00/ 55.00 | 40.00/ — | 60.00/ — |
| No. 1 Soft White Shvs. | 60.00/ 65.00 | 57.50/ 60.00 | 60.00/ — | 70.00/ 75.00 |
| Super Soft White Shvs. | 65.00/ 75.00 | 75.00/ 85.00 | 70.00/ — | — / — |
| Hd. White Shvs. | 85.00/ 90.00 | 90.00/100.00 | 85.00/ — | 95.00/ — |
| Hd. White nv. Cuts | 100.00/105.00 | 105.00/110.00 | 90.00/ — | 113.00/ — |
| Col. Tab. Cards | 45.00/ 47.50 | 45.00/ 47.50 | 50.00/ — | 40.00/ 45.00 |
| Manila Tab. Cards | 65.00/ 67.50 | 65.00/ 67.50 | 70.00/ — | 70.00/ 75.00 |
| No. 1 Col. Ledger | 37.50/ 42.50 | 37.50/ 42.50 | 42.50/ — | 29.50/ 32.50 |
| White Ledger | 50.00/ 55.00 | 52.50/ 57.50 | 52.50/ — | 55.00/ — |
| Mixed Book & Mag.† | 22.00/ 25.00 | — / — | 14.00/ — | — / — |
| No. 1 Books‡ | 19.00/ 21.50 | 17.00/ 19.00 | 30.00/ — | 16.50/ 18.50 |

† Includes Time & Life; no course groundwood. ‡ Not to exceed 10% of groundwood.

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POLISHING

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# Figures of the Week

**PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures**

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

| | | | | | |
|---|---|---|---|---|---|
| | Jan. 30 | Feb. 6 | Feb. 13 | Feb. 20 | Feb. 27 |
| 1960 | 96.3 | 97.8 | 97.9r | 98.0r | 95.6 |
| | Jan. 31 | Feb. 7 | Feb. 14 | Feb. 21 | Feb. 28 |
| 1959 | 89.2 | 90.1 | 88.1 | 90.9 | 93.0 |

r Revised

COMPARATIVE MONTHLY SUMMARIES

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 96.7‡ | 97.3‡ | — | — | — | — | — | — | — | — | — | — | — |
| 1959 | 87.8 | 90.5 | 93.2 | 94.4 | 95.5 | 95.6 | 84.5 | 96.0 | 92.4 | 97.4 | 96.2 | 86.6 | 94.0 |

‡ Preliminary

COMPARATIVE YEARLY SUMMARIES

| | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 |
|---|---|---|---|---|---|---|---|---|
| Year to Date | 95.2 | 94.3 | 95.2 | 100.2 | 95.5 | 88.1 | 89.0 | 97.1 |
| Year Average | 92.3 | 91.6 | 96.2 | 97.9 | 90.4 | 87.0 | 94.0 | — |

*All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.*

**PAPERBOARD OPERATING RATIOS†—National Paperboard Assn. Figures**

COMPARATIVE WEEKLY SUMMARIES

| | | | | | |
|---|---|---|---|---|---|
| | Jan. 30 | Feb. 6 | Feb. 13 | Feb. 20 | Feb. 27 |
| 1960 | 97 | 96 | 96 | 96 | 91 |
| | Jan. 31 | Feb. 7 | Feb. 14 | Feb. 21 | Feb. 28 |
| 1959 | 92 | 93 | 94 | 94 | 92 |

COMPARATIVE MONTHLY SUMMARIES

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 92 | — | — | — | — | — | — | — | — | — | — | — | — |
| 1959 | 89 | 94 | 95 | 94 | 96 | 96 | 83 | 97 | 92 | 97 | 94 | 80 | 92 |

† *Per cents of operation based on "inch-hours" reported on a 6-day basis to the National Paper board Association.*

**SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures**

| ITEM | THIS WEEK ENDING Feb. 27, 1960 | LAST WEEK ENDING Feb. 20, 1960 | CUMULATIVE TO DATE Jan. 1 to Feb. 27, 1960, incl. |
|---|---|---|---|
| % Activity | 91% | 96% | 93% |
| Total | 308,026 | 329,793 | 2,524,140 |
| Liner | 98,596 | 118,937 | 873,636 |
| Corrugating Material | 47,911 | 49,560 | 393,208 |
| Chip & Filler Board | 4,529 | 6,265 | 40,427 |
| Total Containerboard | 151,036 | 174,762 | 1,307,271 |
| Folding | 59,915 | 57,446 | 459,593 |
| Set-Up | 10,848 | 10,462 | 93,395 |
| Special Food Board | 28,909 | 28,132 | 225,278 |
| Other | 57,318 | 58,991 | 438,603 |
| Total Boxboard | 156,990 | 155,031 | 1,216,869 |
| **Total Orders** | | | |
| Received | 307,798 | 298,097 | |
| Unfilled End of Week | 441,069 | 440,962 | |


*always in the market*

*baltimore*
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*detroit*
*jersey city*
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*oakland*
*philadelphia*

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*graders and packers of waste paper*

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PAPER MILL DESIGN PROCESS ENGINEERING POWER PLANTS

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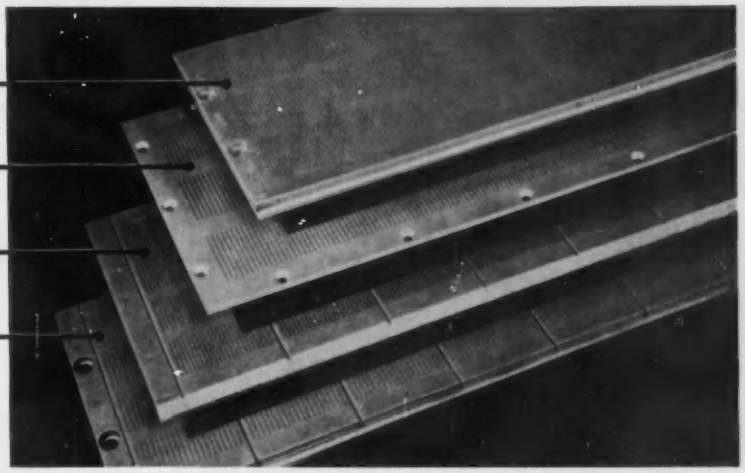
REPORTS APPRAISALS ESTIMATES AND SURVEYS

# 4 STAINLESS SCREEN PLATES by MAGNUS

## for Maximum Flow of Cleaner Pulp on any type of job!



**5/32" MULTI-SERVICE PLATE** – T-bar Style, solid, one-piece top, stronger than bronze, with wide relief milling for high capacity, and the corrosion resistance of 100% stainless steel construction.

**1/4" SOLID PLATE** – The heavy, one-piece, stainless steel plate with built-in higher strength and longer life.

**5/8" BEVELED CHANNEL PLATE** – Thin-sheet, fabricated design eliminates relief milling and permits increased screening capacity.

**5/8" T-BAR CHANNEL PLATE** – High-strength, thin-sheet fabricated design, similar to the above except with T-bar channel frame.

**MAGNUS** Screen Plates, made of stainless chrome-nickel-steel, are your best assurance of consistently higher yields of cleaner pulp at low operating cost. That's because slots remain sharp and side walls highly polished for the life of the plate. And plates last longer because of their extremely high resistance to corrosion. Leading paper makers from coast to coast know that it pays to specify MAGNUS for all types of screen plates — stainless, inconel or bronze, for flat or rotary screens and for all types of standard fastening methods. Write us for complete information.

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Fitchburg, Massachusetts
*Subsidiary of* **NATIONAL LEAD COMPANY**

*Metalworkers for the Paper Trade*
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**VALVES:** GATE · SWING CHECK · BLOW · GLOBE · ANGLE AND "Y"

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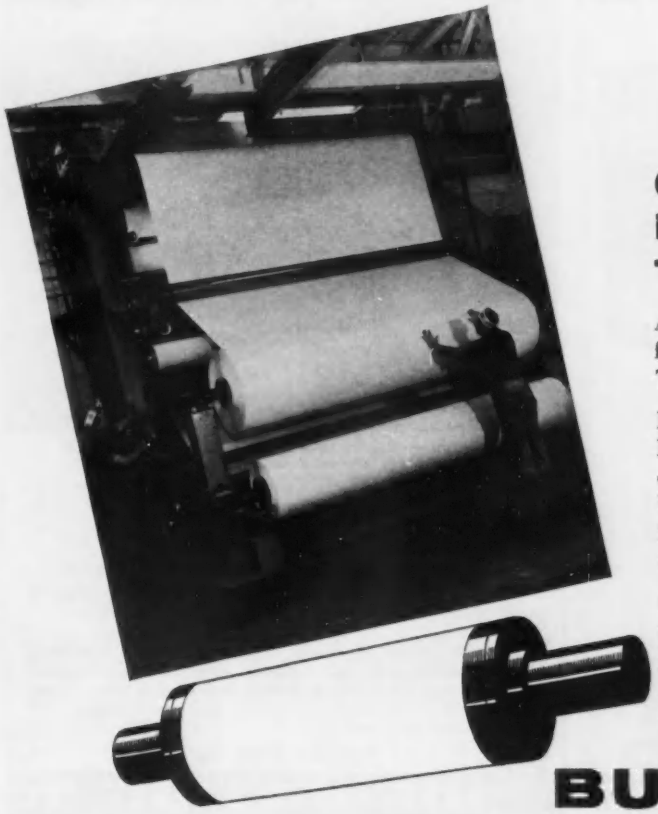

# GREAT NAMES in the Paper Industry: The Mead Corporation

A Butterworth bleached roll with special filling is used in this supercalender stack at The Mead Corporation, Chillicothe, Ohio.

Butterworth Rolls, used by the leaders in the Paper Industry, are made to specification and checked for hardness, smoothness, and density before delivery. You can see the difference in finer finishes, extra hours of service without turning down or refilling.

Furnished new or refilled for every calendering need. And you get Butterworth Rolls at competitive prices. Quotations on request.

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**BUTTERWORTH**
**More than 60 years of Roll-Making Experience**

## *Removes* IRON and GRIT

## ••• RONNINGEN DUO Filter

Above view shows the DUO Filter Unit B-1118-Std.—1″ Inlet; 2″ x 18″ Filter Element; 20 to 200 Mesh Monel Metal. Bronze with Quick Couplings. Larger units also available.

**DUO — We filter together or alone**

**You may back wash us or blow us down —couple or uncouple — in seconds — no tools!**

This modern line of Quick-Coupling, Flanged Monel Screen, non short circuiting Bronze Filters and Strainers available in Single and Duo Units.

20 to 700 Mesh; Pressures to 200 psi; Temperatures to 200°F. For water, oils, chemicals and viscous liquids.

Available in Bronze, Steel, or 316 Stainless Steel.

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**Write for Bulletin 35902 Dept. PT**

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Stainless Steel and Rolled Bronze

*Plain or Chromium Plated*

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# Wax Emulsions

LUKON offers a newly improved range of wax emulsions with maximum clarity, stability and brightness. Emulsions made to order. For technical information write:

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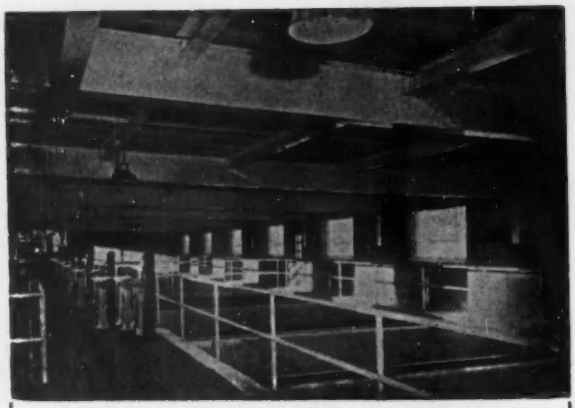

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**Demineralizing Plants**
**Water Softening Plants**
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**and**

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# GUARTEC® in the furnish—for improved fine papers!

General Mills versatile guar gum, GUARTEC, not only provides smoother, more printable paper surfaces—it also contributes to better fiber formation and fuzz-lay-down. GUARTEC improves filler retention, too—that is, it actually reduces the amount of filler needed to do a quality job!

PRODUCTS CONTROL
QUALITY AND UNIFORMITY INSURED

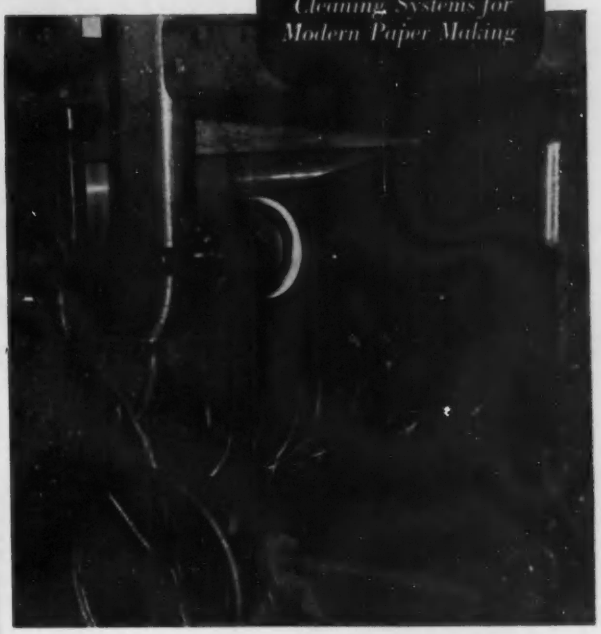
**NOTE:** GUARTEC carries this General Mills Products Control Seal. This means that a composite sample of every lot is fully checked for its dispersibility and quality standards to assure highest uniform performance possible.

"*Wherever paper is made*—GUARTEC *is making it better.*" And *whatever* your grade of paper or board, GUARTEC can help keep your quality high—your cost low. For complete technical details, contact:

**SPECIAL COMMODITIES DIVISION** Minneapolis 26, Minnesota

General Mills

*Modern Cleaning Systems for Modern Paper Making*



# How to prolong felt life without downtime

Excessive downtime often makes washing felts more costly than buying new ones. An Oakite cleaning system solves the problem. It keeps felts in top form—while they're at work!

How? A permanent shower system is installed over the felt. When soils clog felt, a solution of a recommended Oakite felt washing compound is sprayed on, loosening soil, lifting the nap. Clear water rinsing flushes away dirt and solution residues. Felts are left clean, soft and full-napped. They last longer . . . paper is kept free of foreign matter . . . there's no lost time.

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THE
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**ONE** Lightweight Machine That Tests
PAPER & PAPERBOARD
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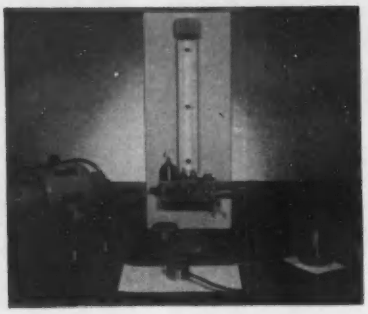
SMOOTHNESS . . . POROSITY . . . HARDNESS
*Instantaneously*
Sole Distributors



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**ACCURATE:** No oil or dust can enter instrument. Smoothness not effected by porosity.
**VERSATILE:** Completely self contained, portable, no special training required. Tests smoothness, porosity & printing hardness. Accessories available for paperboard & hardboard.

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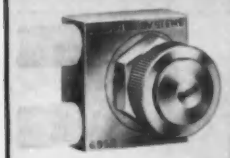

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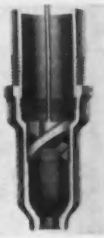

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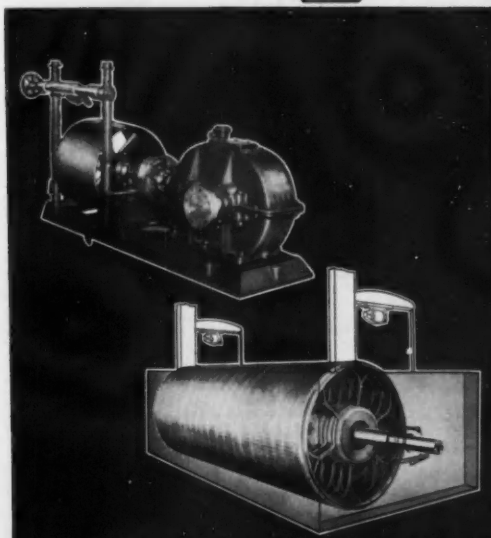

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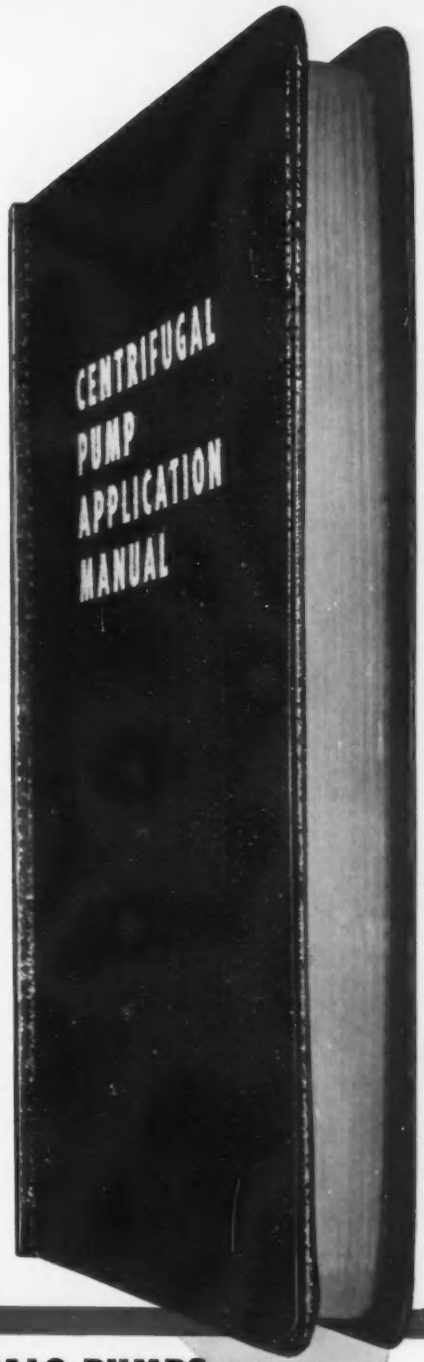


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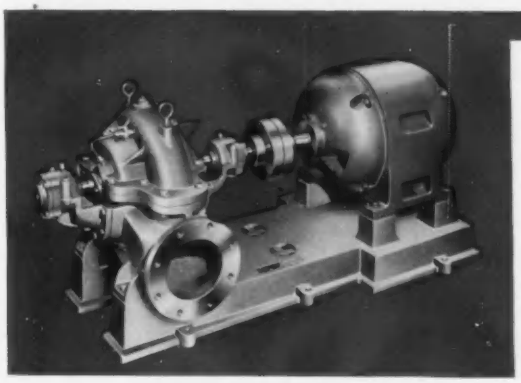

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